

DRAFT

**West Chicago Environmental Response
Trust**

Final Completion Report – Reach 7

Kress Creek/West Branch DuPage River Site

February 2012



Certification

To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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Kress Creek/West Branch
DuPage River Site

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Acronyms and Abbreviations

ACAR	Audit Corrective Action Report
BBL	Blasland, Bouck & Lee, Inc.
BOL	Bill of Lading
C	Coefficient of Conservatism
CAR	Corrective Action Report
CD	Federal Consent Decree between Kerr-McGee and the United States of America, State of Illinois
CFR	Code of Federal Regulations
CMRDP	Conceptual Mitigation and Restoration Design Plan
CQAP	Construction Quality Assurance Plan
FD/RA	Final Design/Remedial Action
FQI	Floristic Quality Index
GPS	Global Positioning System
HASP	Health and Safety Plan
IEMA/DNS	Illinois Emergency Management Agency/Division of Nuclear Safety
ICN	Interim Change Notice
MOU	Memorandum of Understanding
NCR	Non-Conformity Report
QAPP	Quality Assurance Project Plan
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
RC _s	Relative Coverage by Species
REF	Rare Earths Facility
RF _s	Relative Frequency of Species
RIV _n	Relative Importance Value
RPM/OSC	Remedial Project Manager/On-Scene Coordinator
SOW	Statement of Work
STP	Sewage Treatment Plant
TMSP	Targeted Material Stabilization Plan
Tronox	Tronox LLC, formerly known and referred to as Kerr-McGee Chemical LLC [Kerr-McGee]
WCERT	West Chicago Environmental Response Trust, formerly known as Tronox
USEPA	United States Environmental Protection Agency
WBK	Wills, Burke, and Kelsey Associates

1. Introduction

This Final Completion Report has been prepared by ARCADIS U.S., Inc. (ARCADIS, formerly known as Blasland, Bouck & Lee, Inc.; engineering/design firm and BBL Environmental Services, Inc.; Remedial Contractor) on behalf of the West Chicago Environmental Response Trust (WCERT; who acquired environmental liability from Tronox LLC; formerly known as Kerr-McGee Chemical LLC on February 14, 2011). This document summarizes the remedial action, restoration, and mitigation activities performed in Reach 7 (which includes removal areas identified as R7-1 through R7-3, removal areas R8-1 and R8-2, as well as the notch cut in to the Warrenville Dam). These activities were performed at the Kress Creek/West Branch DuPage River Site (Kress Creek Site) and the River Portion of the Sewage Treatment Plant Site (STP Site), collectively referred to as the Sites, both located in DuPage County, Illinois. A plan for the monitoring of the restored areas is also provided. A summary of the results from the restoration/mitigation monitoring performed for Reach 7 will be submitted annually under separate cover (as described in Section 8).

1.1 Background

Historical operations at the West Chicago Rare Earths Facility (REF), where thorium and other elements were extracted from monazite sands, bastnasite, and other ores between 1932 and 1973, and the STP, which received debris and waste from the REF, resulted in the distribution of low level radioactive thorium residuals in portions of Kress Creek, the West Branch DuPage River, and their associated floodplains.

Extensive site characterization activities were performed to delineate areas at the Sites with radioactivity levels of thorium residuals (BBL, 2004). A site remedy (remedial action) was developed based on the site investigation findings and the baseline human health and ecological risk assessments performed by the United States Environmental Protection Agency (USEPA). The remedial action was designed to be consistent with the requirements set forth in 40 Code of Federal Regulations (CFR) Part 192 in implementing the Uranium Mill Tailings Radiation Control Act and the Illinois Source Material Milling Facility Licensing Regulations under Title 32 of the Illinois Administrative Code Part 332.

The selected remedial activities implemented at the Sites is based upon an extraordinarily extensive level of characterization activities and lengthy and detailed dialogue among Kerr McGee, USEPA, and representatives of the Local Communities, including the City of West Chicago, West Chicago Park District, DuPage County, the

Forest Preserve District of DuPage County (Forest Preserve), and the City of Warrenville. This characterization effort defined the limits of excavation of targeted materials to assure protection of human health and the environment.

Specifically, the remedial activities in Reach 7 were performed to achieve the performance standards and other requirements as specified in the Federal Consent Decree for the site including its appendices between Kerr-McGee and the United States of America, State of Illinois (CD; April 18, 2005), and the Kerr-McGee and the Local Communities Consent Decree (March 23, 2005).

The remedial action activities for Reach 7 were performed in accordance with the *Conceptual Mitigation and Restoration Design Plan* (BBL, 2005d), *Common Scoping and Planning Documents for the Remedial Action at the Kress Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant*, (Common Scoping and Planning Documents, BBL, 2005e), *Final Design/Remedial Action Work Plan – Reach 7 for the Kress Creek/West Branch DuPage River Site* (Reach 7 FD/RA Work Plan, ARCADIS, May 2010) and associated Interim Change Notices (ICNs).

1.2 Description for Reach 7

Reach 7 is approximately 2,500 feet long in its entirety and extends along the West Branch DuPage River from Butterfield Road to the Warrenville Dam. There are two islands within Reach 7, referred to herein as the north island and the south island. The main channel flow through Reach 7 is along the west side of the north island and the east side of the south island. A significantly lesser flow traverses the east side of the north island and the west side of the south island; these areas are referred to herein as backwater areas. Removal in Reach 7 was predominately located in the riverbed with limited removal within the floodplain.

This Final Completion Report focuses solely on the remedial action activities that were completed for Reach 7. A site location map is provided in Figure 1-1. Reach 7 is entirely located within the Roy C. Blackwell Forest Preserve. Removal in Reach 7 addresses areas located both within the floodplain and the river bed. Additionally, two removal areas in Reach 8 (R8-1 and R8-2) were addressed during Reach 7 activities in order to facilitate the installation of the bypass pumping and the energy dissipation structure. The original in-situ estimated volume of soil removal for Reach 7 (including R8-1 and R8-2) included approximately 11,800 cubic yards of overburden and 23,300 cubic yards of target material, for a total excavation volume of 35,100 cubic yards.

1.3 Performance Standards

The performance standards for the remedial action in Reach 7 are as follows:

1. Removal of Material to Pre-Determined Elevations

Targeted soils and sediment from the Sites will be removed to pre-determined Global Positioning System (GPS) survey points in accordance with the CDs. The pre-determined points for the areas within Reach 7 are presented in the *Excavation Verification Plan*, which is included in Appendix A-2 of the Reach 7 FD/RA Work Plan and associated ICNs.

2. Restoration and Mitigation Activities

Impacted areas will be restored and/or mitigated as required and monitoring and maintenance activities will be performed in accordance with the *Conceptual Mitigation and Restoration Design Plan* (BBL, 2005d), the *Reach-Specific Restoration Plan*, which is included in Appendix B of the Reach 7 FD/RA Work Plan, and as outlined in Section 2.1.6 of the Reach 7 FD/RA Work Plan and associated ICNs.

1.4 Report Organization

This report was prepared in accordance with the requirements specified in Section 4.3 - Final Completion Report(s) of the CD, as well as Section 2.7 in the Reach 7 FD/RA Work Plan. This report summarizes the remedial action construction and restoration activities performed in Reach 7, and is divided into the following sections:

- Section 1 – Introduction
- Section 2 – Remedial Action Summary
- Section 3 – Design Deviations
- Section 4 – Quality Assurance and Quality Control
- Section 5 – Record Drawings
- Section 6 – Representative Project Photographs

- Section 7 – Records of Removal Quantities and Off-Site Waste Disposal
- Section 8 – Monitoring of Restoration/Mitigation Areas
- Section 9 – References

1.5 Document Control

All project records (Documents) required by the CD for the subject remedial action activities have been prepared and are maintained in the file room at the REF located in West Chicago, Illinois, in the custody of the Document Control Group. A copy of the project file index can be found in Appendix A. These Documents shall remain on file in accordance with the CD pursuant to the requirements of USEPA. At the end of the required retention time, USEPA will be notified at least 90 days prior to document destruction and will be given the opportunity to assume custody of the Documents if requested.

1.6 Good Faith Estimate of Total Costs Incurred

WCERT estimates that the total cost for completing the remedial action for Reach 7 is approximately \$31,915,000. This good faith cost estimate for Reach 7 is based on the primary remedial construction activities that occurred during the period of September 2009 through August 2011.

2. Remedial Action Summary

This section summarizes the major tasks and presents a chronological description of major remedial action activities performed in Reach 7.

2.1 General

In September 2003, Kerr McGee retained ARCADIS (formerly known as ARCADIS BBLES and BBL Environmental Services, Inc.) to implement the remedial action at the Sites. The remedial action consisted of excavation of “targeted materials,” as defined in the CD, and site restoration. A series of verification points were established that defined the horizontal locations and vertical elevations of excavation limits. These predetermined verification points, along with other remedial design criteria, were adhered to during the remedial action to monitor the work performance. Any deviations from the design submittals are discussed in Section 3 of this report.

In addition to the Reach 7 FD/RA Work Plan, a number of relevant project documents (and associated ICNs) were prepared and followed during the implementation of the remedial action construction, restoration, and monitoring. Below is a list of these documents:

- Conceptual Mitigation and Restoration Design Plan (BBL, 2005d)
- Common Scoping and Planning Documents (BBL, 2005e)
 - Document 200: Quality Assurance Project Plan (QAPP)
 - Document 300: Construction Quality Assurance Plan (CQAP)
 - Documents 400 and 401: Health and Safety Plans (HASP)
 - Document 500: Emergency Contingency Plan
 - Document 600: Dust Control Plan
 - Document 700: Air Monitoring Plan
 - Document 800: Global Positioning System Verification Plan
 - Document 900: Targeted Material Stabilization Plan

2.2 Description of Remedial Action Activities

The majority of the remedial action activities for Reach 7 were completed between May and November 2010. The remaining restoration activities for Reach 7 were performed between April and November 2011. The remedial action activities consisted of five major tasks. These major tasks and a description of some typical activities performed under each task are as follows:

- Site Preparation – Activities performed prior to excavation, including utilities clearance, setup of temporary construction facilities, work force mobilization, and installation of erosion and sedimentation controls, haul roads and staging areas
- Water Diversion – A bypass pumping and piping system was installed to bypass pump the section of river in Reach 7 from directly downstream of the Prairie Path Pedestrian Bridge to downstream of the Warrenville Dam.
- Overburden Removal and Verification – This includes excavation of overburden material, verification of excavation limits using survey grade GPS and Total Station Land Surveying Equipment, verification sampling of overburden material for reuse using gamma ray survey technology, followed by composite soil sampling and analysis, and stockpiling of overburden for reuse.
- Excavation and Disposal of Targeted Materials – This includes removal of targeted materials to predetermined verification points, verification of excavation limits using survey grade GPS and Total Station Land Surveying Equipment, and direct loading or stockpiling/loading and transport of excavated targeted materials to the REF for subsequent off-site transportation (via rail) and disposal.
- Excavation Verification – This includes GPS survey verification of excavation depths in accordance with the GPS Verification Plan (Document 800), comparison of as-built excavation data to the verification points, preparation of GPS verification packages, and notification to USEPA, Illinois Emergency Management Agency/Division of Nuclear Safety (IEMA/DNS), USEPA remedial project manager/on-scene coordinator (RPM/OSC), and Local Communities Representatives of verification results.
- Restoration – Activities to restore the site for beneficial use including backfilling, topsoil placement and seeding, installation of erosion control measures, planting of trees and shrubs, and other riverbank restoration elements.

2.3 Chronological Narrative of Remedial Activities Performed

A chronological narrative of the remedial action activities performed in Reach 7 is presented below.

2.3.1 Project Approvals

The following approvals were obtained prior to commencing excavation and restoration activities for Reach 7:

- On October 28, 2008 and November 25, 2008, respectively, USEPA and Wills, Burke, Kelsey Associates [WBK]), on behalf of the Local Communities, granted approval for performing vegetative clearing and constructing haul roads/staging areas in Reach 7 by approving ICN No. 1 to the Reach 7 FD/RA Work Plan (Section 3).
- On February 4, 2010, USEPA approved the Reach 7 FD/RA Work Plan.
- On May 24, 2010, a pre-construction meeting was held for the remedial work in Reach 7 at the REF in West Chicago, Illinois, and was attended by Tronox, ARCADIS, the regulatory agencies (i.e., USEPA RPM/OSC and IEMA/DNS), and the Local Communities' Representative.
- On June 8, 2010, WBK, on behalf of Local Communities, approved the Reach 7 FD/RA Work Plan.
- Prior to use, the source of borrow soil to be used as backfill was identified and tested to verify that it had met the project criteria for backfill. Testing results of borrow soil are kept on file at the REF in West Chicago, Illinois.
- USEPA, IEMA/DNS, and the Local Communities Representative were notified in advance of the intention to perform GPS Verification Survey on a weekly basis.
- On July 1, 2010, the “Memorandum of Understanding Regarding the Notching of the Warrenville Dam and Constructing a Historic River Channel Rock Blanket” (MOU) was executed by the Forest Preserve, Tronox, and ARCADIS. This MOU documented the arrangement by which the Warrenville Dam was notched, and the rock blanket was installed in Reach 7 (see Appendix C).

2.3.2 Remedial Action Activities

A chronological description for remedial activities performed at Reach 7 is presented below:

- Clearing and installation of the access road and construction trailer and parking lot staging area between Butterfield Road and the Prairie Path Trail were completed in December 2008, in accordance with ICN No. 1 to the Reach 7 FD/RA Work Plan. These areas were cleared in advance of Reach 7 construction activities to help facilitate the cleanup of previous reaches by creating a storage area for construction materials.
- Survey stakeout of the access roads, staging areas, and bypass pipe corridor commenced in May 2010.
- Mobilization of the construction crew and equipment began on June 7, 2010. The access/haul roads and staging areas were cleared and constructed; perimeter construction fencing, silt fencing, and signage were installed; and the installation of the bypass piping and pumping system began.
- Removal areas R8-1 and R8-2 were addressed during Reach 7 construction activities to facilitate the installation of the bypass piping and the energy dissipation structure. Excavation of overburden and targeted material in R8-2 and R8-1 was completed on July 2, 2010 and July 13, 2010, respectively.
- Excavation of the northern half of R7-1 was completed in July 2010, using a three-sided sheet pile enclosure and localized dewatering.
- On July 23, 2010, bypass pumping began in Reach 7, and fish relocation activities were completed.
- In August 2010, the excavation of the remaining portion of R7-1 and all of R7-2 was completed. The bypass pumping operations continued and two excavation crews began working in R7-3; one in the northern portion of the main channel and one mid-reach in between the two islands.
- On August 19 and 20, 2010, notching of the Warrenville Dam was completed.

- Excavated soils and other materials (e.g., roots and tree stumps) containing targeted material were transported to the REF, where they were managed under the IEMA/DNS Radioactive Material License #STA-583 and subsequently loaded on railcars and transported to the Energy Solutions Facility (State of Utah - 11e.(2) By Product Materials License #UT2300478) for final disposal. All excavated material was transferred to the REF from the Reach 7 staging area via truck. Trucking of material to the REF started on August 30, 2010.
- In September 2010, the excavation of overburden and targeted material in the northern portion of the main channel and the area between the north and south islands of R7-3 was completed. The excavation activities then proceeded to the southern portion of the main channel and the backwater area west of the south island. The river bank restoration and the installation of the rock blanket in the northern portion of the main channel were completed.
- On October 14, 2010, the excavation of overburden and targeted material in the southern portion of the main channel and the backwater area west of the south island in R7-3 were completed. The placement of clean overburden as backfill, final grading, installation of the rock blanket, boulder clusters, root wads, rock berms, and riverbed restoration in the main channel and backwater area west of the south island were completed on October 19, 2010, and the bypass pumping system was turned off on October 20, 2010. The excavation of overburden and targeted material in backwater area east of the north island commenced on October 29, 2010.
- The excavation of overburden and targeted material backwater area east of the north island was completed on November 9, 2010. This completed the excavation of overburden and targeted material in Reach 7.
- Field verification of overburden and targeted material excavation limits for Reach 7 was performed on a daily basis with survey grade GPS and Total Station Land Surveying Equipment to demonstrate that the performance standards for overburden segregation and targeted material removal were met. GPS verification points achieved within Reach 7 were summarized and distributed daily as the excavation work progressed. A list of these GPS survey data summary submittals is provided in Appendix B.
- On January 3, 2011, the Notification of Successful GPS Verification Survey packages for the bottoms of overburden and targeted material for Reach 7 were

distributed to the regulatory agencies and Local Communities representatives. These submittals are provided in Appendices E and F, respectively.

- Air quality was monitored during the excavation of overburden and targeted material, and the data summarized each month and included in the monthly progress reports that were distributed by Tronox to the regulatory agencies and Local Communities' Representatives.
- During the remediation of Reach 7, water column monitoring was performed upstream and downstream of active remedial areas on a daily basis to identify and respond to potential water column impacts, if necessary. The monitoring data was distributed in the Daily QC Reports, the monthly progress reports, and are also provided in Appendix D.
- The final backfill and grading restoration work in the river corridor was completed on November 12, 2010.
- Trucking of targeted material from the Reach 7 staging area to the REF continued through February 1, 2011. In 2010, the loading of railcars continued through December 16, 2010. A total of 429 railcars of targeted material were loaded and shipped from the REF to Utah for disposal in 2010. The resumption of railcar loading and shipping and the initiation of the restoration activities in Reach 7 were halted until spring 2011. The materials transported to the REF were stockpiled until approval was received to resume railcar loading.
- Following the required approvals, beginning on April 18, 2011 and concluding May 2, 2011, 52 additional railcars were loaded with targeted material from Reach 7 and subsequently shipped to Utah for disposal, bringing the total number of railcars shipped with Reach 7 targeted material to 481. As of May 2, 2011, all targeted material from Reach 7 had been removed from the REF.
- In April 2011, rocks were cleared and topsoil was added to bring the Reach 7 bypass corridor to final grade. The bypass pipe corridor was hydroseeded, along with the area used to access R7-1 on the east side of the river, the access road from R7-1 to the main staging area, and the access roads from the main staging area to the river. River bank areas were covered with erosion control blankets.
- In May 2011, final grading of the Reach 7 main staging area was completed. The only area of Reach 7 remaining to be graded is the stone access road from

Butterfield Road to the main staging area, and the former construction trailer area and parking lot. Because the Forest Preserve has requested use of the stone access road for maintenance projects in that area for the remainder of 2011 and the spring 2012, this area will be brought to final grade in late spring 2012.

- In May 2011, vegetation restoration continued in Reach 7. This included hydroseeding and replacement tree and shrub planting. On October 28, 2011, the installation of all replacement plantings in Reach 7 was completed, with the exception of plantings slated for the access road and parking lot area. These areas will be graded in the spring 2012, and the remaining plantings will be installed at that time.
- On November 15, 2011, ARCADIS issued the final planting Record Drawings for Reach 7 to the Local Communities' Representatives for their review and field verification.
- On November 22, 2011, the Post-Construction Walk-Through Inspection for Reach 7 was performed and attended by representatives of WCERT, USEPA, IEMA/REM, WBK, ARCADIS, and ARCADIS' landscaping subcontractor, McGinty Bros. A punchlist of incomplete items was compiled and subsequently distributed on December 7, 2011.
- Upon completion of the punchlist items, the Post-Construction Inspection Final Report will be issued, an addendum to this Completion Report will be issued, and the restoration monitoring and maintenance phase for Reach 7 will be initiated.

2.4 Backfill Materials

Two primary types of backfill materials were used as backfill for site restoration in Reach 7. These included overburden material and imported backfill materials. A description of these backfill materials is presented below.

2.4.1 Overburden Material

Overburden soil was stockpiled at dedicated staging areas for subsequent gamma survey and sampling to demonstrate that the material did not exceed the approved cleanup criterion. Following gamma surveying and soil sampling, USEPA and IEMA/DNS representatives performed an independent survey of the stockpiled materials prior to their approval of the use of overburden as backfill. Overburden

testing and sampling results are on file at the REF and are included in Appendix G. Approximately 7,387 loose cubic yards of overburden were generated and reused for backfill to restore Reach 7.

2.4.2 Imported Backfill Materials

Imported backfill materials were identified and tested prior to being imported to the Sites for use in accordance with Document 200 of the Common Scoping and Planning Documents. The imported material sampling data are provided in Appendix H. The source of the imported earth fill, clay, topsoil, and river rock fill was Art Lootens and Son, Inc. facility, located at 0S551 Joliet Road, West Chicago, Illinois 60185.

3. Design Deviations

This section describes any deviations from the design submittals associated with the Reach 7 FD/RA Work Plan and the Common Scoping and Planning Documents during the implementation of the remedial action. Deviations are documented in three types of project documents, which include Non-Conformity Reports (NCRs), Corrective Action Reports (CARs), and ICNs. In addition, quality system audits are performed periodically. Audit findings are documented as audit corrective action reports (ACARs), and the ACARs are classified as either a major or minor finding.

3.1 Non-Conformity Reports

A listing of the NCRs associated with the remedial action activities in Reach 7 is presented in Table 3-1. Copies of the NCRs are on file at the REF. In addition a comprehensive tracking spreadsheet listing all the NCRs, CARs and ACARs for the entire project is presented in Table 3-2.

3.2 Corrective Action Reports

There was one CAR issued for the remedial action activities performed in Reach 7. CAR 2010-001 was issued by Tronox on September 29, 2010 due to a Notice of Violation from the State of Utah DEQ regarding the observation of three leaking railcars loaded with Reach 7 targeted material that had arrived at Energy Solutions disposal facility in Clive, Utah. Corrective Action Reports were prepared and submitted by Tronox to both the State of Utah DEQ and IEMA. The primary corrective procedures were additional mixing of lime and stabilization time before trucking the material to the REF and loading railcars to lower the percent moisture of the material; the railcars were also lined with 14-mil polypropylene liners. These corrective actions were implemented, and the railcar shipping was allowed to resume by IEMA on November 3, 2010.

No ACARs were issued for the remedial activities performed in Reach 7.

3.3 Interim Change Notices

There were nine ICNs issued for the Reach 7 remedial action activities. A brief summary of each ICN is provided below.

- ICN No. 1 for Reach 7 was issued on October 23, 2008 to the Draft Reach 7 FD/RA Work Plan to allow for vegetative clearing and construction of haul roads/staging areas in Reach 7 while the Reach 7 FD/RA Work Plan was going in the process of being prepared. This ICN was approved by USEPA on October 28, 2008 and the Local Communities' Representative on November 3, 2008.
- ICN No. 2 for Reach 7 was issued June 24, 2010 to Volume 1 of 2, Appendix A-1 Engineering Drawings, Appendix A-2 Excavation Verification Plan and Volume 2 of 2 Appendix B, of the Reach 7 FD/RA Work Plan to allow Removal areas R8-1 and R8-2 to be excavated as part of Reach 7 activities. This ICN was approved by USEPA on June 28, 2010 and the Local Communities' Representative on June 27, 2010.
- ICN No. 3 for Reach 7 was issued on July 27, 2010 to Volume 1 of 2, Appendix A-2, of the Reach 7 FD/RA Work Plan to document revisions to the Verification Data for Excavation Interior table. This ICN was approved by USEPA on August 10, 2010 and the Local Communities' Representative on August 9, 2010.
- ICN No. 4 for Reach 7 was issued on December 1, 2010 to Appendix A-1, and Appendix B of the Reach 7 FD/RA Work Plan to document the changes to the design based on conditions encountered in the field as well as to reflect additional wetland delineation. This ICN was approved by USEPA on July 28, 2011 and by the Local Communities' Representative on January 19, 2011.
- ICN No. 5 for Reach 7 was issued on December 1, 2010 to Volume 1 of 2, Document 101, Appendix A-1, of the Reach 7 FD/RA Work Plan to document the relocation of the northern and southern rock berms and temporary sheetpile cofferdam locations. This ICN was approved by USEPA on December 7, 2010 and the Local Communities' Representative on January 19, 2011.
- ICN No. 6 for Reach 7 was issued on July 27, 2010 to Document 101, Volume 1 of 2, Appendix A-1, and Volume 2 of 2, Appendix D of the Reach 7 FD/RA Work Plan to document the removal of 4 to 6-inch layer of drainage stone below the articulated concrete block mats. This ICN was approved by USEPA on August 10, 2010 and by the Local Communities' Representative on January 10, 2012.
- ICN No. 7 for Reach 7 was issued on August 12, 2010 to Appendix A-1, and Appendix D, Drawing D-4 of the Reach 7 FD/RA Work Plan to document revisions to the Big Bremme Creek bypass pumping system. This ICN was approved by

USEPA on July 28, 2011 and by the Local Communities' Representative on August 16, 2010.

- ICN No. 8 for Reach 7 was issued on October 27, 2011 to Appendix B of the Reach 7 FD/RA Work Plan to document the change in restoration monitoring periods and performance standards for woody plants. This ICN was subsequently determined to not be necessary since all plantings requiring monitoring are located in upland habitats. As such, no approvals are necessary for this ICN.
- ICN No. 9 for Reach 7 was issued on February 2, 2012 to Appendix B to document the change in location of the aquatic plants from Reach 7 to Reach 6, and to summarize the revisions to the monitoring limits and performance standards of the seeded areas in Reach 7.

In addition to these reach-specific ICNs, twenty one ICNs have been issued to update the Common Scoping and Planning Documents. These ICNs are summarized in Table 3-3.

3.4 Modifications to Original Design

There were instances where the Reach 7 FD/RA Work Plan details were modified in the field to adjust field conditions or to adopt better construction practices. These modifications have been documented in the Record Drawings to the extent they impact the actual limits of disturbance and represent a permanent condition. Examples of field modifications that were implemented include:

- The limits of disturbance were modified as necessary as field conditions dictated.
- The vegetation restoration plans were modified on Forest Preserve properties based on detailed communications with the Local Communities' Representative regarding the tree and shrub plantings and the installation of in-river enhancements.
- Variations from the design coordinates and elevations of the drill holes and boundary points were recorded and are provided in Appendices E and F (the Comprehensive GPS Verification Tables for Bottom of Overburden and Bottom of Targeted Material, as well as the GPS Verification Points Figures for Bottom of Overburden and Bottom of Targeted Material). In all cases, all of the targeted material was excavated and removed.

- In the tables included in Appendices E and F, comments were noted for the points in areas where all of the overburden material to be excavated was handled as targeted material. This was done for reasons of cost effectiveness in areas with minimum thickness and/or volume of overburden material, or where deep roots prevented the easy separation of overburden from the underlying targeted material.

4. Quality Assurance and Quality Control

The remedial action was performed under the auspices of an internally managed quality assurance (QA) program that was expressed in the form of a Quality Assurance Manual, which follows the international standard ISO 9000. The Quality Assurance Project Plan (QAPP; Document 200 of the Common Scoping and Planning Documents) was prepared in accordance with this manual. The QAPP was also prepared in accordance with USEPA QAPP guidance documents, in particular, the Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans (QAMS-005/80), and the Region V Model QAPP (1991).

The QAPP provided positive management control and included procedures and requirements to establish a record of conformance. This QAPP established standard operating procedures, change notices and field work instructions, and provided the operational and administrative requirements for the successful excavation and restoration of the Reach 7 areas. Within this system, individual and organizational responsibilities were assigned for the activities and control measures necessary to achieve, verify, and document conformance. Adherence to this program, approved procedures, and regulatory compliance requirements were mandatory for all Tronox, ARCADIS, and ARCADIS subcontracted employees.

The key project Quality Assurance and Quality Control (QA/QC) elements associated with the remedial action at Reach 7 are as follows:

- Health and Safety – Work was performed consistently in a safe and healthy manner to protect site workers, residents from the surrounding community, and the environment by implementing best practices such as following HASP procedures, monitoring air quality, and controlling dust emission.
- Verification of Excavation Limits – Excavation limits for the overburden segregation and targeted material removal were verified with GPS Verification Survey and documented in the Notification of Successful GPS Verification Survey packages that were distributed to the regulators and are on file in the file room at the REF.
- Material Sampling – Overburden materials were sampled prior to reuse as backfill. Sources of borrow soil were tested before the soil was imported for site use. The documentation of the QA/QC testing is on file in the file room at the REF.

- Mitigation and Restoration Monitoring – Upon the completion of the remedial action, monitoring activities are carried out to evaluate the performance of the restored site. Performance standards were set such that adaptive management measures would be implemented should any deficiencies be identified during the monitoring activities.

The results of the QA/QC activities are presented in appropriate project submittals or project files including GPS Verification Survey packages (Appendices E and F), Health and Safety records (on file), air monitoring and dust monitoring results (on file), sampling results of overburden and imported backfill materials (Appendices G and H), water column monitoring data (Appendix D), and annual reports summarizing the monitoring of performance standards for mitigation and restored areas (starting in 2012).

5. Record Drawings and DCFP Forest Impacts

The site final grading plan and other restoration elements associated with the Reach 7 remedial action activities are documented in the construction Record Drawings provided in Appendix I.

The Record Drawings were developed to reflect post-remediation conditions using the reach-specific design drawings as a base. All temporary structures (e.g., staging areas, haul roads, pumps, etc.) were removed from the drawings, and post-restoration survey information was incorporated to document final conditions at the site. Certain design drawings were not developed into Record Drawings (e.g., pre-construction plan and profile drawings) because the drawing would present redundant information or information that would not reflect the current conditions at the site.

Trees and shrubs were planted on Forest Preserve Property based on the actual limits of disturbance. A figure depicting the area of disturbance to DuPage County Forest Preserve (DCFP) Property in Reach 7 is included in Appendix K.

6. Representative Project Photographs

Photographic documentation was collected during the performance of remedial activities in Reach 7. Project photographs depicting the day's construction activities were included in the Quality Control Daily reports that were compiled by Sevenson Environmental Services. All project photographs are kept on file in the file room at the REF, and representative project photographs for Reach 7 are provided in Appendix J.

7. Records of Removal Quantities and Off-Site Waste Disposal

During the remedial action for Reach 7, two types of materials were removed, transported, and disposed off-site, which included:

- Targeted material
- Non-targeted material that was not used as backfill

Descriptions of these removed materials and their management are presented below. Records for material shipping and disposal, including truck shipment Bills of Lading (BOL) and waste manifests, are kept on file in the file room located at the REF, and are available for inspection.

7.1 Targeted Material

A total volume of approximately 43,662 loose cubic yards of targeted material from Reach 7 were excavated and transported by truck to the REF. This volume was determined based on the number of truckloads that were unloaded at the REF. Each truck was covered with a tarp, assigned a BOL, and traveled to the REF.

The material transported to the REF consisted of targeted material, tarps and plastic liners used for the targeted material staging area. The soil at the dump pad was then moved to the REF direct load-out stockpile area and managed under the IEMA/DNS Radioactive Material License #STA-583. As each stockpile was created, it was sampled to verify radiological characteristics and moisture content, and subsequently loaded into weighed gondola railcars. The loaded railcars were then transported via train, to Energy Solutions' (formerly known as Envirocare of Utah Inc.) Clive Disposal Site (State of Utah - 11e.(2) By Product Materials License #UT2300478) for final disposal at:

Interstate 80, Exit 49
Clive, Utah 84029
Phone: (801) 532-1330

A total of approximately 51,183 tons of material generated from Reach 7 remedial action activities were shipped in 481 railcars (via rail) for disposal.

7.2 Non-Targeted Material Not Used as Backfill

In Reach 7 there was no excavated non-targeted material that was not used as backfill.

8. Monitoring of Restoration/Mitigation Area

8.1 Introduction

Previous sections of this report summarized the remedial and restoration activities performed in Reach 7, and Record Drawings (Appendix I) were prepared to document the locations that the various seed mixes were applied and the species and locations of planted trees and shrubs.

Monitoring of the restored banks, structures and habitats is required by the Statement of Work attached to the CD. The monitoring requirements are consistent with the methodologies presented in the *Conceptual Mitigation and Restoration Design Plan* (CMRDP; BBL, 2005d) and the Reach 7 FD/RA Work Plan, which were reviewed and approved by the USEPA and the Local Communities. The Post-Construction Inspection Walk-Through for Reach 7 was conducted on November 22, 2011. A number of Punch List items that will be addressed by spring 2012 were identified during the walkthrough and issued to the regulating agencies on December 7, 2011. The Post-Construction Inspection Final Report documenting the completion of the remedial action construction activities for Reach 7 will be issued once the punchlist items have been completed, at which time the monitoring period for Reach 7 will begin.

Restored banks and vegetative communities will be monitored annually to evaluate stability and to collect quantitative vegetation data for comparison to performance standards. It should be noted that in-stream structures will not be monitored under this monitoring program as the DCFP has taken over responsibility for their stability (per the MOU) as a result of additional enhancements performed by the DCFP and the modifications the DCFP had performed to Warrenville Dam which lowered the water surface elevation in Reach 7. Vegetation monitoring events may be conducted in the spring, summer and fall to identify plant species flowering in different seasons. Table 8-1 summarizes the site-specific monitoring activities and performance standards for Reach 7. Each required year of vegetation monitoring will terminate at the completion of the summer or fall monitoring event conducted, beginning with the first complete growing season following restoration. The first year of bank monitoring will terminate with the completion of an inspection 10 to 14 months after their construction. Subsequent annual bank monitoring events will occur 10 to 14 months after the previous monitoring event.

Qualitative inspections of restored areas, consisting of visual inspection of restored banks and habitats in Reach 7, may occur throughout the year to evaluate stability and

vegetation status and to determine if any maintenance activities are required to meet performance standards. Observations made during qualitative inspections will be photo documented as field conditions permit (e.g., low enough water levels to observe banks and structures). Activities to be conducted during the spring, summer and fall monitoring events are described below. The results of the monitoring activities will be documented in annual reports which will contain the results of monitoring and maintenance activities to be conducted in Reach 7 to evaluate the health and progress of seeded and planted vegetation, the stability of restored banks in the reach, and the development of upland and wetland habitats towards meeting vegetation performance standards.

8.2 Spring Inspection

Qualitative inspections of restored areas, consisting of visual inspection of restored banks and habitats in Reach 7, may occur throughout the year to evaluate stability and vegetation status and to determine if any maintenance activities are required to meet performance standards. Specific activities to be conducted during the spring monitoring event are described below.

8.2.1 Bank Inspection

Bank stability monitoring is required to be performed for three years, with at least one event occurring after a storm that equals or exceeds the bankfull (approximately a 2-year recurrence frequency) discharge of 512 cubic feet per second (cfs) (*Conceptual Design Report*, BBL, 2002). During bank inspection, restored banks will be inspected for signs of erosion that would jeopardize the integrity of the bank. The limits of a "bank" extend from the toe of slope to the first observable break in slope. Signs of significant erosion include toe erosion causing undercutting, lateral erosion above the rock protection, exposed geotextile fabric, or vertical erosion down the face of the bank from overland flow entering the river. Stability will be evaluated by visual observation and comparison to design drawings, considering location in the stream, physical dimensions, and designed hydraulics. Bank areas found to be significantly eroding will be repaired in accordance with a maintenance activity design report that will be generated prior to the initiation of any major maintenance activity. Bank monitoring may alternatively be performed whenever water levels are low enough to allow bank inspection.

8.2.2 Tree and Shrub Survival Monitoring

The performance standard for tree and shrub survival in restored areas is 90% survival. The Record Drawings presented in Appendix I show the locations of the new trees and shrubs planted in Reach 7 as part of the restoration effort. These Record Drawings reflect any revisions made since approval of the Reach 7 FD/RA Work Plan related to landowner and Local Communities representative input, or changes in the actual limits of disturbance from the limits anticipated at the time of plan preparation.

The Record Drawings provide the baseline numbers of trees and shrubs for assessment of tree and shrub survival. The percent tree and shrub survival will be based on visual assessment of the health of all planted trees and shrubs. Individual counts are more accurate in areas of this size than the sub-sampling quadrat method (which was presented as a monitoring option in the CMRDP and Reaches 7 FD/RA Work Plan).

Surviving trees and shrubs should exhibit healthy and abundant leaves, live buds, vertical orientation, no exposed roots, and green inner bark. The number of surviving tree and shrubs in the reach will be divided by the number of trees and shrubs originally planted in the reach to calculate the percent survival in Reach 7. As is currently being discussed with the DCFP, areas that meet the 90% survival performance standard after the first full growing season and monitoring event may have protective cages removed from the trees and shrubs and further maintenance or monitoring may not be performed on the planted trees and shrubs. Areas that do not meet the 90% survival performance standard after the first year will receive replacement plantings in accordance with the maintenance activities identified in the Annual Monitoring Report and further maintenance or monitoring may not be performed on the planted trees and shrubs.

8.2.3 Photo Documentation

Photographs will be taken of restored banks and constructed in-stream structures to document observed conditions before visibility is hindered by mature vegetation. Photographs with captions describing the location and direction of photograph will be provided in a photo log attachment to the Annual Monitoring Report.

8.3 Summer Monitoring Event

The status of the restored vegetative communities and habitats of Reach 7 will be evaluated during the summer inspection with regard to their ability to meet specific performance standards. Portions of Reach 7 that were disturbed for remedial activities on Forest Preserve property were restored by others as part of a river-wide enhancement project. As is currently being discussed with the DCFP, those areas may not be monitored under this monitoring program. The quantitative summer inspection of the habitats restored under this project will occur in July or August and will consist of herbaceous vegetation data collection and photo-documenting the development of restored areas over time. Table 8-1 summarizes the data collection requirements and performance standards for the quantitative monitoring efforts. Details of the components of the summer monitoring effort are provided in the following sections.

8.3.1 Herbaceous Vegetation Monitoring

The vegetation of restored banks and upland and wetland habitats will be monitored to document the progress of the vegetation development towards the vegetation performance standards of 90% cover on restored DCFP properties, less than 15% cover by invasive species in restored bank areas, and less than 5% invasive species in uplands (Table 8-1). Invasive species include, but are not limited to: annual blue grass (*Poa compressa*); Kentucky blue grass (*Poa pratensis*); common buckthorn (*Rhamnus cathartica*), glossy buckthorn (*Rhamnus frangula*); smooth brome (*Bromus inermis*); tall fescue (*Festuca elatior*); quack grass (*Agropyron repens*); honeysuckle (*Lonicera spp.*); and reed canary grass (*Phalaris arundinacea*); cattail (*Typha spp.*); common reed (*Phragmites australis*); purple loosestrife (*Lythrum salicaria*); sandbar willow (*Salix interior*); barnyard grass (*Echinochloa crusgalli*).

Monitoring of herbaceous vegetation will utilize 1-square meter sample plots located randomly in restored vegetation areas. The numbers of plots that will be utilized in each restoration area are presented in Table 8-1. The random plot locations will be identified prior to entering the field using a random number generating program to select gridline intersections of a grid superimposed over the site. In the field, data collected from each plot will consist of the visually estimated percent ground cover, the identification of all plant species present in the plot, and the visually estimated percent cover of each species in the plot. In the instance that an unknown species is encountered in a restored area, a representative specimen of the species will be collected for identification by the Local Communities' Representative or brought to the

Morton Arboretum for identification. The percent ground cover of a restoration area will be represented by the average percent cover values observed in all plots in that restoration area. The average percent ground cover will be compared to the site-specific performance standard presented in Table 8-1 to determine if the performance standard is met or if repairs are required to meet the performance standard by the third growing season. Corrective actions will be performed in accordance with maintenance activities identified in the Annual Monitoring Report.

The following additional herbaceous vegetation metrics apply to vegetation of DCFP property:

- At least 90% of exposed areas will be vegetated by the end of the first three growing-season months (i.e., after July 1).
- By the end of the third full year after planting no area over the entire vegetated restoration area greater than 0.5 square meters should be devoid of vegetation.
- The relative importance value of total native plants (RIV_n) shall increase from the end of the first full growing season to the end of the third full growing season after planting. The RIV_n is calculated by first calculating relative frequency (RF_s) and relative coverage (RC_s) of each species in each quadrat. RF is the measure of the level of occurrence of a single species in a given plant community. RC is the percentage of area occupied by a single species in a given plant community where the sum of the species' cover in that community equals 100%. The relative importance value (RIV_s) of each native species is then calculated by the equation:

$$\frac{RF_s + RC_s}{2} \times 100 = RIV_s$$

- A native mean Coefficient of Conservatism value or C (native mean C value) of greater than or equal to 3.5 shall be achieved for the entire restoration area by the end of the third year after planting. The C value is the measure of native plant community quality established by Swink and Wilhelm (1994). A Floristic Quality Index (FQI), which is a plant community measure of the C value, will also be calculated by multiplying the C value by the square root of the number of native species. The C value and FQI must increase from the first to the third year after planting.

- If the native mean C value, native FQI and/or RIV_n have not increased from the first to the third growing season; appropriate corrective actions will be taken to achieve the restoration intent of the design.
- By the end of the third full year after planting, none of the three most dominant plant species in the restoration areas may be non-native species or weedy species including: annual blue grass (*Poa compressa*); Kentucky blue grass (*Poa pratensis*); common buckthorn (*Rhamnus cathartica*), glossy buckthorn (*Rhamnus frangula*); smooth brome (*Bromus inermis*); tall fescue (*Festuca elatior*); quack grass (*Agropyron repens*); honeysuckle (*Lonicera spp.*); and reed canary grass (*Phalaris arundinacea*); cattail (*Typha spp.*); common reed (*Phragmites australis*); purple loosestrife (*Lythrum salicaria*); sandbar willow (*Salix interior*); barnyard grass (*Echinochloa crusgalli*).

Vegetation metrics related to percent cover will be calculated from the vegetation plot data. Species-specific data collected from the vegetation plots will be utilized to calculate the Mean C value, FQI and RIV_n metrics, where required, for evaluation against performance standards for these metrics that require an increase in each metric from the first growing season to the end of the third growing season. The performance standard requiring no areas larger than 0.5 square meters to be devoid of vegetation will be evaluated based on a site walkover specifically for that purpose. Areas greater than 0.5 square meters in size will be noted and corrective actions will be performed in accordance with maintenance activities identified in the Annual Monitoring Report.

8.3.2 Photo Documentation

Photographs will be taken of restored areas to document observations and to provide a record of vegetation development over time. Permanent photograph locations will be established in the field that provide a general overview of each restored bank, vegetative community, and constructed structure. A labeled wooden stake will be installed at each photo location and its location will be instrument surveyed so it can be reproduced for subsequent monitoring events if the stake is removed or lost. Photographs with captions describing the location and direction of photograph will be provided in a photo log attachment to the Annual Monitoring Report.

8.4 Fall Meander Survey

If required, fall flowering vegetation will be identified and surveyed in the restored habitats on DCFP properties during the fall inspection to assist in developing vegetation metrics that are required to evaluate vegetation development. A meander survey will be performed in each restored habitat that will include the identification of all species of herbaceous vegetation that can only be identified in the fall when they are flowering. The fall meander survey will not be required if the summer monitoring activities are conducted late enough in the growing season to include fall flowering species.

8.5 Report Preparation

An Annual Monitoring Report will be prepared each year of the required monitoring period. The first Annual Monitoring Report that will address Reach 7 will be issued in December 2012. This monitoring report will summarize the observations during the field monitoring activities, present data tables with the required vegetation metrics calculations, and provide photographs of restored areas from permanent locations to document the temporal development of vegetation.

If the restoration performance standards presented above are not achieved in Reach 7 within three years of the completion of restoration, appropriate corrective restoration measures will be performed in accordance with maintenance activities identified in the Annual Monitoring Report. If the restoration monitoring standards presented above are achieved in Reach 7 their required monitoring period, the restoration will be deemed successful and no further maintenance or monitoring will be required or performed.

9. References

ARCADIS, 2009. Final Completion Report – Reach 7 for the Kress Creek/West Branch DuPage River Site, May 2010.

BBL, 2002. Conceptual Design Report – Kress Creek/West Branch DuPage River. DuPage County, IL. 2002.

BBL, 2004. Remedial Investigation Report - Kress Creek/West Branch DuPage River and Sewage Treatment Plant Sites, Dupage County, IL, 2004.

BBL, 2005a. Conceptual Mitigation and Restoration Design Plan, February 2005.

BBL, 2005b. Common Scoping and Planning Documents for the Remedial Action at the Kress Creek/West Branch DuPage River Site and the River Portion of the Sewage Treatment Plant Site, May 2005.

Swink, F. and G. Wilhelm. 1994. *Plants of the Chicago Region*. 4th Edition. Indianapolis: Indiana Academy of Science, 1994.

Tables

Table 3-1
Kress Creek/West Branch DuPage River Site
Final Completion Report - Reach 7
West Chicago Environmental Response Trust
DuPage County, Illinois

Listing of Corrective Action Reports (CARs), Audit Corrective Action Reports (ACARS) and Non-Conformity Reports (NCRs) - Reach 7

Issued in 2010						
CARs	Date	Description	Root Cause	Initiator	Correction	Status
REF 2010-001	9/29/2010	Three leaking railcars observed upon arrival at disposal site in Clive, Utah	Procedure Deviation	Tronox	Corrective Action Plan (CAP) issued to Tronox on 10/29/2010, which included more lime mixing, longer mixing times, and using poly liners in railcars. Tronox issued CAP to IEMA on 11/01/2010. IEMA approved resumption of railcar shipments on 11/03/2010.	Resolving upper moisture content limit
NCRs	Date	Description	Root Cause	Initiator	Correction	Status
NCR KC/WB-2010-001	7/1/2010	Failure to locate utility	Procedure Deviation	ARCADIS	JULIE field response and utility investigation determined the line to be abandoned in place. No further action required.	Closed Out 7/20/2010
NCR KC/WB-2010-002	07/10/2010	Overburden was targeted material	Plan Deviation	ARCADIS	Procedure was reviewed. Expected targeted material design flaw. No further action required.	Closed Out 8/2/2010
NCR KC/WB-2010-003	7/12/2010	Utility was damaged during installation of sheetpile.	Procedure Deviation	ARCADIS	JULIE field response. Utility was marked. Damaged line was temporarily rerouted to avoid further disturbance. Procedures were reviewed with field staff.	Closed Out 8/23/2010
NCR KC/WB-2010-004	7/14/2010	Peristaltic pump was not functional prior to water column sampling activities.	Procedure Deviation	ARCADIS	Functional peristaltic pump was ordered and received. Peristaltic pump will be periodically tested for functionality.	Closed Out 7/23/2010
NCR KC/WB-2010-005	7/20/2010	Railroad track repair subcontractor did not have prerequisite training prior to work activities.	Lack of Training	ARCADIS	All applicable training documentation will be required prior to permitting subcontractors to conduct work on site. Training will be verified for subcontractor in question.	Closed Out 9/7/2010
NCR KC/WB-2010-006	8/12/2010	Targeted material was eroded during flooding.	Procedure Deviation	ARCADIS	Documented and reported to necessary parties. Excavation and verification of washout area via GPS verification and gamma scan of removed material.	Closed Out 8/24/2010
NCR KC/WB-2010-007	8/23/2010	A Work Air Monitor (WAM) was located in an upwind position from the material handling area.	Procedure Deviation	ARCADIS	The HPT stationed at the area and the RSO were informed. All HPTs were briefed on the Air Monitoring SOP 212. The existence of wind direction flags was verified.	Closed Out 8/24/2010
NCR KC/WB-2010-008	8/27/2010	Overburden material was improperly gamma surveyed.	Lack of Training	ARCADIS	Procedure was reviewed with the HP technician and On the Job Training (OTJ) was conducted.	Closed Out 9/3/2010

Table 3-1
Kress Creek/West Branch DuPage River Site
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DuPage County, Illinois

Listing of Corrective Action Reports (CARs), Audit Corrective Action Reports (ACARS) and Non-Conformity Reports (NCRs) - Reach 7

Issued in 2010						
NCRs	Date	Description	Root Cause	Initiator	Correction	Status
NCR KC/WB-2010-009	9/10/2010	Unsuitable overburden material was not segregated as targeted material.	Lack of Training	ARCADIS	Unsuitable material was segregated as targeted material. Procedure was reviewed with the HP technician and OJT was conducted. All techs were instructed to record cpm ranges in logbooks.	Closed Out 9/14/2010
NCR KC/WB-2010-010	11/1/2010	The WAMs located in the TM Stabilization Pad were not running because they had run out of fuel.	Procedure Deviation	ARCADIS	The HPT stationed at the area and the RSO were informed. HPTs were instructed to check and record hourly that all air monitors in their work area are functional.	Closed Out 11/3/2010
NCR KC/WB-2010-011	11/5/2010	Overburden material was sampled prior to gamma survey.	Procedure Deviation	ARCADIS	The material of elevated activity was removed as targeted material. The area was re-sampled. Procedure was reviewed with the SES employee conducting the Overburden soil sampling.	Closed Out 11/9/2010
Issued in 2011						
NCRs	Date	Description	Root Cause	Initiator	Correction	Status
NCR KC/WB-2011-001	1/16/2011	The gate and derailers on the railspur of the RLF were left unlocked by CN.	Procedure Deviation	ARCADIS	Gates and derailers were locked. Disposal contractor and railcrews were contacted and notification sent to all associated parties.	Closed Out 9/7/2011
NCR KC/WB-2011-002	1/28/2011	One WAM located in the TM Stabilization Pad was not running because it had run out of fuel.	Procedure Deviation	ARCADIS	The HPT stationed at the area and the RSO were informed. HPTs were instructed to check and record hourly that all air monitors in their work area are functional and generators are sufficiently fueled.	Closed Out 2/21/2011

Table 3-2
Kress Creek/West Branch DuPage River Site
Final Completion Report - Reach 7
West Chicago Environmental Response Trust
DuPage County, Illinois

Total Project Tracking Spreadsheet for All Corrective Action Reports (CARs), Audit Corrective Action Reports (ACARs) and Non-Conformity Reports (NCRs)

ISSUED IN 2005						
CARS	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
KC-05-001	Reach 1	9/23/2005	IEMA	IEMA field observations in Reach 1 regarding safety requirements	9/27/2005	
Major ACARs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
05-VA-04-01	Reaches 1 & 2	10/21/2005	Tronox	Project training requirements and documentation	4/11/2006	
05-VA-06-01	Reaches 1 & 2	12/2/2005	Tronox	Need to adopt railcar loading operational procedures	4/11/2006	
05-VA-06-02	Reaches 1 & 2	12/2/2005	Tronox	Need to develop targeted material stabilization/mixing procedures	4/11/2006	
Minor ACARs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
05-VA-04-02	Reaches 1 & 2	10/21/2005	Tronox	Training materials did not have supervisor approval signature	4/11/2006	
05-VA-04-03	Reaches 1 & 2	10/21/2005	Tronox	No test records onsite for DOT and Radworker training	4/11/2006	
05-VA-04-04	Reach 5A	10/21/2005	Tronox	Reading assignments and work instructions not signed by supervisor	4/11/2006	
05-VA-04-05	Reaches 1 & 2	10/21/2005	Tronox	Map in Overburden Verification Package KC-027A did not label three points	4/11/2006	Pertained to and addressed in Reach 5A Final Completion Report.
05-VA-04-06	Reaches 1 & 2	10/21/2005	Tronox	Deviations from WCP 372 regarding background and efficiency checks	4/11/2006	
05-VA-04-07	Reaches 1 & 2	10/21/2005	Tronox	Log book for water column monitoring did not address >50 NTU delta on 09/14/05	4/11/2006	
05-VA-04-08	Reaches 1 & 2	10/21/2005	Tronox	Maps/Tables in GPS verification tables showed tolerance of 0.24'; not 0.25'	4/11/2006	
05-VA-04-09	Reaches 1 & 2	10/21/2005	Tronox	Validation and calibration checks were not documented in field log books	4/11/2006	
05-VA-04-10	Reaches 1 & 2	10/21/2005	Tronox	GPS surveyors did not have documented training and reading assignments	4/11/2006	
NCRs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
BBLES 2005-001	Reaches 1 & 2	11/7/2005	ARCADIS	Deficiency in health and safety incident reporting and documentation	11/7/2005	
BBLES 2005-002	Reach 1	4/13/2006	ARCADIS	Did not survey ground surface for two overburden points prior to excavating overburden and targeted material in one excavation event	4/13/2006	
ISSUED IN 2006						
CARS	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
WB-2006-001	Reach 5B	9/11/2006	ARCADIS	GPS survey data for overburden point R5B-9-7957t was not recorded	9/22/2006	
Major ACARs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
KC-06-VA-04-01	Reach 5A	11/10/2006	Tronox	Post-Construction Inspection Report was not issued within 14 days of the inspection for Reach 5A	12/14/2006	Report issued on 12/13/06.
Minor ACARs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
KC-06-VA-04-02	Reaches 3A, 3B and 4	11/10/2006	Tronox	After review, compaction testing was not required for non-structural fill	12/14/2006	
KC-06-VA-04-03	Reaches 3A, 3B and 4	11/10/2006	Tronox	No safety or training records were onsite for McGinty Bros. workers (landscapers)	12/14/2006	
KC-06-VA-04-04	Reaches 3A, 3B and 4	11/10/2006	Tronox	Need to review and revise seed mixture submittal requirements	5/8/2007	Section 02420 was revised by ICN No. 10 to Common Scoping Documents.
KC-06-VA-04-05	Reaches 3A, 3B and 4	11/10/2006	Tronox	Seed mix submittals are required two weeks prior to planting	12/14/2006	
NCRs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
BBLES 2006-001	Reach 3A	4/27/2006	ARCADIS	Turbidity curtain should have been installed in Reach 3A prior to beginning excavation of bypass sump in the creek, and water column monitoring should have been initiated	5/2/2006	
BBLES 2006-002	Reaches 3A, 3B and 4	5/28/2006	ARCADIS	Derailer at RLF was left locked, preventing pickup of railcars	6/1/2006	
BBLES 2006-003	Reach 3A	6/7/2006	ARCADIS	Released an exclusive use vehicle for repairs prior to final rad survey	6/15/2006	
BBLES 2006-004	Reach 3B	6/14/2006	ARCADIS	Construction equipment created ruts in targeted material area	6/15/2006	

Table 3-2
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DuPage County, Illinois

Total Project Tracking Spreadsheet for All Corrective Action Reports (CARs), Audit Corrective Action Reports (ACARs) and Non-Conformity Reports (NCRs)

ISSUED IN 2007						
CARS	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
WB-2007-001	Reaches 5C & 5D	5/1/2007	ARCADIS	Surveyors were using a database for GPS verification points that was outdated	5/4/2007	
WB-2007-002	Reach 5E	10/3/2007	ARCADIS	ARCADIS' surveying subcontractor surveyed but did not record overburden verification final elevation for Point R5E-6-T153. Adjacent points were properly recorded and overburden pile was scanned and met backfill criteria	10/4/2007	
Major ACARs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
07-VA-04-01	Reaches 5E and 6	9/20/2007	Tronox	The complete Restoration Mitigation Project Team (identifying the surveying and landscaping subcontractors) was not shown on the organizational chart in the draft FD/RA Work Plan for Reach 5E and 6 and previous work plans	10/22/2007	Organizational chart was expanded to include subcontractors.
07-VA-04-02	Reaches 5C & 5D	9/20/2007	Tronox	A detailed project restoration schedule was not provided to Tronox	10/22/2007	
07-VA-04-03	Restoration Monitoring in Reaches 1, 2, 3A and 5A	9/20/2007	Tronox	Performance monitoring activities in Reaches 1, 2, 3A and 5A were initiated without final as-built drawings being approved and issued	1/28/2008	In Annual Monitoring Reports, summary tables and record drawings are coordinated, and will be the basis for ongoing restoration monitoring.
07-VA-04-04	Restoration Monitoring in all reaches	9/20/2007	Tronox	FD/RA Section 2.6 (Data Management) does not include Restoration & Mitigation activities	4/9/2008	
Minor ACARs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
None						
NCRs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
KC-2007-001	Reach 5C & 5D	10/16/2007	Tronox	24 railcars were loaded and shipped over a period of 3 shipments (09/26/07 - 13 railcars, 10/04/07 - 6 railcars, and 10/09/07 - 5 railcars) using the wrong lot number	11/14/2007	
BBLES 2007-001	Reach 5C	6/4/2007	ARCADIS	Health physics technician failed to properly document radiological surveys for loadout of Truck Shipment Nos. 28, 30 and 34 from Reach 5C	6/5/2007	
ISSUED IN 2008						
CARS	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
KC/WB-2008-001	Reaches 1, 2, 3A, 3B, 4	5/14/2008	ARCADIS	Initial tree tag survey was not updated to reflect actual accounting of disturbed trees in Reaches 1, 2, 3A, 3B and 4	11/7/2008	ICN No. 11 to the Common Scoping Documents added SOP 230-Tree Tagging and Tracking
KC/WB-2008-002	Reach 1	5/16/2008	ARCADIS	File references and originating drawing references for Reach 1 Record Drawing B-13 Final Grading Plan had inconsistencies	8/7/2008	
KC/WB-2008-003	Reach 6	11/6/2008	ARCADIS	Six railcars loaded at the REF with targeted material from Reach 6 were observed leaking and ultimately had to be unloaded, targeted material stabilized with lime at the REF, and then when it had properly dried was reloaded into the railcars	12/12/2008	
Major ACARs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
None						
Minor ACARs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
08-VA-04-01	Reach 5B restoration monitoring	9/4/2008	Tronox	Drawings used for Reach 5B restoration monitoring were not on Tronox document library website	10/30/2008	
08-VA-04-02	Reach 5C	9/4/2008	Tronox	Drawings used for planting and seeding activities in Reach 5C were not the approved drawings on the Tronox document library website	10/30/2008	Field drawings were "blown up" drawings for easier reading and note taking. ARCADIS restoration manager will note on the oversized drawings "OK for monitoring use".
08-VA-04-03	Reaches 5C, 5D and 5E	9/4/2008	Tronox	No evidence of owner approved planting plans for Forest Preserve properties	10/30/2008	Forest Preserve planting plans for Reaches 5C, 5D and 5E were posted on Tronox library website.

Table 3-2
Kress Creek/West Branch DuPage River Site
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DuPage County, Illinois

Total Project Tracking Spreadsheet for All Corrective Action Reports (CARs), Audit Corrective Action Reports (ACARs) and Non-Conformity Reports (NCRs)

NCRs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
NCR KC/WB-2008-001	Reaches 1, 2, 3A, 3B, 4.5A, 5B and 5C	5/19/2008	ARCADIS	Seed mixes used in restoration did not exactly match seed mixes in Work Plans	8/12/2008	Supplied seed mixes were re-reviewed and approved.
NCR KC/WB-2008-002	Reach 5B	5/28/2008	ARCADIS	Additional surveying was required to characterize the pools, and hummocks and hollows for the Reach 5B record drawings	5/30/2008	
NCR KC/WB-2008-003	Reach 6	5/30/2008	ARCADIS	JULIE was not contacted prior to excavation in Excavation Area Nos. R6-1 and R6-2	6/2/2008	JULIE Dig Log was created to provide two week plan for upcoming digs.
NCR KC/WB-2008-004	Reach 6	6/17/2008	ARCADIS	Discrepancy found in bottom verification elevations for Points B3 and B6 in Excavation Area No. R6-20 in Verification Drawings R and S	6/17/2008	Excavations were dug to lowest elevation shown, drawings were revised.
NCR KC/WB-2008-005	Reach 5E	6/30/2008	ARCADIS	Work was slightly postponed while air monitor for confined space entry in Wetland 2 (storm manhole) in Reach 5E was calibrated	6/30/2008	
NCR KC/WB-2008-006	SMSB Demolition	6/30/2008	ARCADIS	A scrap metal box filled with cleaned material from the Stabilized Material Storage Building (SMSB) demolition was removed from the REF before the smear samples analyses were available. One hour later the smear analyses showed the materials were clean	6/30/2008	
NCR KC/WB-2008-007	SMSB Demolition	7/1/2008	ARCADIS	Site and task specific training pertaining to demolition was not conducted prior to the start of SMSB demolition	7/1/2008	
NCR KC/WB-2008-008	Reaches 5E & 6	7/1/2008	ARCADIS	Loader to be used at the REF was ordered for delivery on June 30, 2008, but vendor did not deliver loader until July 1, 2008	7/1/2008	
NCR KC/WB-2008-009	Reach 6	7/16/2008	ARCADIS	Overexcavation of Point R6-7-12346 by 0.15'. The area where truckload was dumped was scanned and cleared, and overburden scanning and sampling was within acceptable limits	7/16/2008	Area had several large rocks and construction debris at OB/TM interface.
NCR KC/WB-2008-010	Reach 6	7/16/2008	ARCADIS	Railcar needed an additional strap due to insufficient clamp-to-railcar contact	7/22/2008	
NCR KC/WB-2008-011	Reaches 5E and 6	7/18/2008	ARCADIS	Railcar needed an additional strap due to insufficient clamp-to-railcar contact	7/22/2008	
NCR KC/WB-2008-012	Reaches 5C & 5D	7/23/2008	ARCADIS	Shipment of Reach 5C and 5D targeted material was delayed awaiting placards	7/23/2008	Shipment got delayed one day.
NCR KC/WB-2008-013	Reaches 5C & 5D	8/4/2008	ARCADIS	The proposed planting plan for Reach 5C & 5D showed plant plug species that were not listed in the approved table	9/2/2008	
NCR KC/WB-2008-014	Reaches 5E & 6	8/8/2008	ARCADIS	Data from the downwind Dust Trak monitoring lime stabilization of targeted material could not be retrieved on 08/08/08	8/18/2008	The downwind Dust Trak did not show any elevated readings for the entire day.
NCR KC/WB-2008-015	Reaches 5E & 6	8/19/2008	ARCADIS	On 08/19/08 Ludlum Model 3 survey meter with a Ludlum 44-40 beta gamma detector was found to be past the calibration date of 08/14/08.	8/27/2008	Unit was not used for beta survey on 08/19/08 and was taken out of service until it was calibrated.
NCR KC/WB-2008-016	Reaches 5E & 6	10/27/2008	ARCADIS	Wrong railcar number was recorded on inspection form. Error was caught and corrected when filling out the loading sheet	10/28/2008	
NCR KC/WB-2008-017	Reach 5C	10/28/2008	ARCADIS	When final planting survey for Reach 5C was forwarded to ARCADIS for preparation of record drawings, it was found that the format was not fully usable for the AutoCAD software and additional conversions were required	11/17/2008	
ISSUED IN 2010						
CARS	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
REF 2010-001	Reach 7	9/29/2010	Tronox	Three leaking railcars observed upon arrival at disposal site in Clive, Utah. CAP issued to Tronox on 10/29/2010, which included more lime mixing, longer mixing times, and using poly liners in railcars. Tronox issued CAP to IEMA on 11/01/2010. IEMA approved resumption of railcar shipments on 11/03/2010.	Ongoing	Resolving upper moisture content limit
NCRs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
NCR KC/WB-2010-001	Reach 7	07/01/2010	ARCADIS	Failure to locate utility	7/20/2010	JULIE field response and utility investigation determined the line to be abandoned in place. No further action required.
NCR KC/WB-2010-002	Reach 7	07/10/2010	ARCADIS	Overburden was targeted material	8/2/2010	Procedure was reviewed. Expected targeted material design flaw. No further action required.
NCR KC/WB-2010-003	Reach 7	07/12/2010	ARCADIS	Utility was damaged during installation of sheetpile.	8/23/2010	JULIE field response. Utility was marked. Damaged line was temporarily rerouted to avoid further disturbance. Procedures were reviewed with field staff.
NCR KC/WB-2010-004	Reach 7	07/14/2010	ARCADIS	Peristaltic pump was not functional prior to water column sampling activities.	7/23/2010	Functional peristaltic pump was ordered and received. Peristaltic pump will be periodically tested for functionality.

Table 3-2
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Total Project Tracking Spreadsheet for All Corrective Action Reports (CARs), Audit Corrective Action Reports (ACARs) and Non-Conformity Reports (NCRs)

NCRs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
NCR KC/WB-2010-005	Reach 7	07/20/2010	ARCADIS	Railroad track repair subcontractor did not have prerequisite training prior to work activities.	9/7/2010	All applicable training documentation will be required prior to permitting subcontractors to conduct work on site. Training will be verified for subcontractor in
NCR KC/WB-2010-006	Reach 7	08/12/10	ARCADIS	Targeted material was eroded during flooding.	8/24/2010	Documented and reported to necessary parties. Excavation and verification of washout area via GPS verification and gamma scan of removed
NCR KC/WB-2010-007	Reach 7	08/23/10	ARCADIS	A Work Air Monitor (WAM) was located in an upwind position from the material handling area.	8/24/2010	The HPT stationed at the area and the RSO were informed. All HPTs were briefed on the Air Monitoring SOP 212. The existence of wind direction flags was verified.
NCR KC/WB-2010-008	Reach 7	8/27/10	ARCADIS	Overburden material was improperly gamma surveyed.	9/3/2010	Procedure was reviewed with the HP technician and On the Job Training (OTJ) was conducted.
NCR KC/WB-2010-009	Reach 7	9/10/10	ARCADIS	Unsuitable overburden material was not segregated as targeted material.	9/14/2010	Unsuitable material was segregated as targeted material. Procedure was reviewed with the HP technician and OTJ was conducted. All techs were instructed to record cpm
NCR KC/WB-2010-010	Reach 7	11/1/10	ARCADIS	The WAMs located in the TM Stabilization Pad were not running because they had run out of fuel.	11/3/2010	The HPT stationed at the area and the RSO were informed. HPTs were instructed to check and record hourly that all air monitors in their work area are functional.
NCR KC/WB-2010-011	Reach 7	11/5/10	ARCADIS	Overburden material was sampled prior to gamma survey.	11/9/2010	The material or elevated activity was removed as targeted material. The area was re-sampled. Procedure was reviewed with the SES employee conducting the Overburden soil sampling.
ISSUED IN 2011						
NCRs	Reach	Date Issued	Initiator	Description	Resolution Date	Comment
NCR KC/WB-2011-001	Reach 7	1/16/11	ARCADIS	The gate and derailers on the railspur of the RLF were left unlocked by CN.	9/7/2011	Gates and derailers were locked. Disposal contractor and railcrews were contacted and notification sent to all associated parties.
NCR KC/WB-2011-002	Reach 7	1/28/11	ARCADIS	One WAM located in the TM Stabilization Pad was not running because it had run out of fuel.	2/21/2011	The HPT stationed at the area and the RSO were informed. HPTs were instructed to check and record hourly that all air monitors in their work area are functional and generators are sufficiently fueled.

Note:

1. No CARs, ACARs, or NCRs issued in 2009.

Table 3-3
Kress Creek/West Branch DuPage River Site
Final Completion Report - Reach 7
West Chicago Environmental Response Trust
DuPage County, Illinois

Summary of Interim Change Notices (ICNs)

ICN No.	Referenced Document	Description of Change	Date Issued	Date Approved/Acknowledged by Regulators
Final Design / Remedial Action Work Plan - Reach 1				
1	106, Appendix E	Changing to a single bypass sump using Pool No. 7	E-Mailed on 11/1/2005, hard copies issued on 3/24/06	USEPA and CBB West 11/2/05
2	102, Figure A and Tables	Revised boundary points at May St. culvert, and clarification of redundant boundary points in Reach 1 & 2.	E-Mailed on 11/3/2005, hard copies issued on 3/24/06	USEPA 11/4/05, CBB West 11/3/05
Final Design / Remedial Action Work Plan - Reach 2				
1	106, Appendix E	Changing to a single bypass sump using Pool No. 7	E-Mailed on 11/2/2005, hard copies issued on 3/24/06	USEPA 11/4/2005, CBB West 11/3/05
2	102, Figure A and Tables	Revised boundary points at May St. culvert, and clarification of redundant boundary points in Reach 1 & 2.	E-Mailed on 11/3/2005, hard copies issued on 3/24/06	USEPA 11/4/05, CBB West 11/01/06
Final Design / Remedial Action Work Plan - Reach 3A, 3B and 4				
1	Volume 1, Figure 2-1	Revisions to the upstream and downstream water column monitoring locations	Hard copies issued on 8/9/2006.	USEPA 10/02/07, CBB West 11/01/06
2	Appendix A-2	Add points in Pod Nos. R5B-10 and R5C-3 to Reach 4	E-Mailed on 07/13/06, revised hard copies issued on 8/9/06	USEPA 07/14/06, CBB West 7/16/06
3	Drawing B-26	Substitute native creeping bent grass for lawn grass in Wetland 5B in Reach 4	Hard copies issued on 8/9/2006.	USEPA 10/02/07, CBB West 11/01/06
4	Drawing Nos. A-3B, A-5A and E-2	Combined Reach 3B and 4 into one bypass system, eliminated Reach 3B backflow dam and turbidity curtain.	Hard copies issued on 8/9/2006.	USEPA 10/02/07, CBB West 11/01/06
5	Appendix A-2	Transferred Route 59 bridge area points to subsequent separate work plan	E-mailed on 11/13/07, hard copies issued on 12/21/07.	USEPA 11/20/07, CBB West 11/26/07
6	Volume 2 of 3, Appendix B: Reach Specific Restoration Plan - Reaches 3A, 3B and 4	Kentucky bluegrass and tall fescue species were deleted from the invasive species list for the shady floodplain habitat in Reach 3A.	E-mailed on 11/24/2009	USEPA 12/10/2009, CBB West 11/30/2009
7	Volume 2 of 3, Document 103, Appendix B, Section 4.1, 4.4.	Change in restoration monitoring periods and performance standards for woody plants.	E-mailed on 10/27/2011	USEPA 01/23/2012, WBK 12/29/2011
Final Design / Remedial Action Work Plan - Reach 5B				
1	Volume 1 of 2, Figure 2-1	Revisions to water column monitoring locations	Hard copies issued on 10/24/06	USEPA 10/02/07, CBB West 11/01/06
2	Vol. 2, Appendix E, Drawings E-4 and E-5	Relocated backflow dam for Reach 5B to upstream of the confluence	Hard copies issued on 10/24/06	USEPA 10/02/07, CBB West 11/01/06
3	Volume 2 of 3, Document 103, Appendix B, section 4.1	Change in restoration monitoring periods and performance standards for woody plants.	E-mailed on 11/17/2010	USEPA 01/23/2012, WBK 1/19/2011
Final Design / Remedial Action Work Plan - Reach 5C and 5D				
1, Rev. 1	Volume 1 of 3, Section 2.1.1.9 River Diversion for Excavation	Utilization of three-sided sheetpile enclosure method for isolating, dewatering, excavating backfilling and restoring small defined sections in Reach 5C.	E-mailed copy issued on 10/10/06, hard copies distributed on 10/24/06.	USEPA approved via e-mail on 10/13/06, and CBB West approved via e-mail on 10/12/06.
2, Rev.1	Volume 1 of 3, Sections 2.1.1.5 and 2.1.1.7, Site Clearing and Haul Roads	Allowed clearing and installation of haul roads in winter of 2006-2007 in Reaches 5C and 5D to take advantage of frozen ground conditions to prevent rutting of equipment in excavation areas.	E-Mailed copy issued on 01/31/07, hard copies distributed on 09/11/07.	USEPA approved via e-mail on 10/02/07 and CBB West approved via e-mail on 07/10/07.
3, Rev.1	Volume 1 of 3, Appendix A-1, Drawing A-2D	Deleted access road across four properties on west side of river in Reach 5D, and enlarged sheetpile enclosure for Pod No. R5D-14. [Note: This ICN was originally issued as ICN No.2 to the Reach 5C and 5D FD/RA Work Plan. When it was discovered that ICN No.2 was previously issued for the winter clearing and haul roads, this ICN was revised to ICN No. 3 to the Reach 5C and 5D FD/RA Work Plan.]	E-mailed copy issued on 06/28/07, and additional hydraulic review summary was e-mailed on 07/10/07. Hard copies were issued on 07/13/07. Revised ICN cover form with corrected ICN No. 3, Revision 1 was e-mailed on 08/31/07. Hard copies of revised ICN No. 3, Revision 1 form issued on 09/11/07.	USEPA approved via e-mail on 07/06/07. CBB West approved via e-mail on 07/10/07.
4	Volume 1 of 3, Appendix A-2, Excavation Verification Plan	Adoption of the property specific Excavation Plan for Parcel No. 0427104002 at 29W530 Forestview Drive in Reach 5D.	E-mailed copy issued on 07/17/07, hard copies distributed on 09/11/07.	USEPA 10/02/07, CBB West 12/11/07
5	Volume 1 of 3, Appendix A-1, Drawings A-2C and A-2D	Revised the major river crossing layout in Reach 5D to be diagonal with a sheetpiling section on the east end to construct the eastern off ramp.	E-mailed copies issued on 08/31/07, hard copies distributed on 09/11/07.	USEPA 10/02/07, CBB West 12/11/07
6	Volume 3 of 3, Appendix E - Geotechnical Design, Drawing E-3	Revised the temporary minor river crossing detail by substituting a wooden mat underlayment in lieu of the river rock and geogrid underlayment in the original design.	E-mailed copy issued on 08/31/07, hard copies distributed on 09/11/07.	USEPA 10/02/07, CBB West 12/11/07
7	Volume 3 of 3, Appendix E - Geotechnical Design, Section 2.2, Drawing Nos. E-1 and E-2	Performed excavation of Pod Nos. R5D-17 and R5D-18 in Reach 5D South utilizing benching construction methods in lieu of upgradient sheetpiling due to field conditions encountered.	E-mailed copy issued on 09/18/07, hard copies distributed on 09/24/07.	USEPA 10/02/07, CBB West 12/11/07
8	Volume 1 of 3, Document 100, Section 2.1.6 Restoration	The Reach 5D staging area on Mack Road will not be part of the Reach 5D Post-Construction Walk-Through on 11/20/08, because the staging area is still being utilized. The staging area will be restored once it has completed its use in a separate Post-Construction Inspection Walk-Through.	E-mailed copy issued on 11/20/08.	USEPA 11/25/08, CBB West 11/25/08
9	Volume 2 of 3, Document 103, Appendix B, Section 4.1, 4.4.	Change in restoration monitoring periods and performance standards for woody plants.	E-mailed on 10/27/2011	USEPA 01/23/2012, WBK 12/29/2011
Final Design / Remedial Action Work Plan - Reach 5E and 6				
1	Volume 1, Sections 2.1.1.5 and 2.1.1.7, Site Clearing and Haul Roads	Allowed clearing and construction of access roads and staging areas in Reach 5E while the Reach 5E and 6 FD/RA Work Plan was going through the regulatory review and approval process.	E-mailed copy issued on 08/07/07, hard copies distributed on 09/11/07.	USEPA approved via e-mail on 08/10/07. CBB West approved via e-mail on 08/10/07.
2	Document 100, Volume 1	To allow for interim approval to begin remedial activities in Reach 5E North while the Reach 5E and 6 FD/RA Work Plan is going through the regulatory review and approval process.	E-mailed copy issued on 08/31/07, hard copies distributed on 09/11/07.	On 09/05/07 USEPA and CBB West granted interim approval to begin remedial work in Reach 5E North while the final review and approval of the Reach 5E and 6 FD/RA Work Plan continues to completion.
3	Appendix A-1, Engineering Drawing A-2B	Revisions to minor river crossing layouts	E-mailed copy issued on 10/24/07, hard copies issued on 12/21/07.	USEPA approved on 11/06/07, CBB West approved on 10/28/07
4, Rev.2	Appendix A-1, Engineering Drawing A-2E	Addition of two floating bridge river crossings in Reach 6 South and new access roads on the east bank, with associated restoration plans.	E-mailed copy issued 09/11/08, hard copy issued on 09/26/08.	USEPA approved on 09/16/08, CBB West approved on 09/17/08.
5	Document 100, Section 3 -Schedule and Figures 3-1 and 3-2	Revised the Reach 5E and 6 Project Schedule, and the Overall Project Schedule to reflect use of a more appropriate (considering the current state of the economy) 5-day, 40-hour work week for 2008.	E-mailed on 03/18/08, hard copies issued on 04/01/08.	USEPA approved 06/10/08, CBB West approved 06/10/08
6	Document 100, Volume 1, Section Nos. 2.2 Traffic Control and 2.5.2 Water Column Monitoring	Revised Traffic Control Plan to accommodate request from City Of Warrenville, Revised Water Column Monitoring to reflect bypass pumping was not being utilized in Reaches 5E and 6.	E-mailed on 05/29/08, hard copy issued on 06/13/08.	USEPA approved on 06/03/08, CBB West approved on 05/30/08.
7	Appendix B, Document 104, Drawing B-12A	Revisions to the Reach 5E Mitigated Wetland, in accordance with CBB West's Sketch 1 showing a reduced footprint and a new storm sewer section.	E-mailed on 06/05/08, hard copy issued on 06/13/08.	USEPA approved 06/10/08, CBB West approved 06/11/08
8	Appendix B, Document 103, Drawing B-11B	Added river rock to restored river bank in Excavation Area Nos. R5E-9 and R5E-10.	E-mailed on 07/24/08, hard copies issued on 08/07/08.	USEPA approved on 08/05/08, CBB West approved on 08/05/08.
9	Appendix A-1, Drawing A-2E	Revised sheetpile enclosure for western portion of Excavation Area R6-9.	E-mailed on 08/28/08, hard copy issued on 09/26/08.	USEPA approved on 09/04/08, CBB West approved on 08/28/08.
10	Appendix A-2, Excavation Verification Plan	Clarification of excavation of Boundary Point R6-7-B13.	E-mailed on 09/10/08, hard copy issued on 09/26/08.	USEPA approved on 09/11/08, CBB West approved on 09/10/08.
11	Volume 1 of 3, Document 100, Section 2.1.4	Utilize Targeted Material Stabilization Plan (TMSP) to stabilize the targeted material stockpiled at the REF from Reach 6 South that needs additional stabilization before its loaded in railcars.	E-mailed on 11/20/08	USEPA 11/25/08, CBB West 11/25/08
12	Volume 2 of 3, Appendix B, Drawings B-12D and B-12E	Postponed installation of in-river aquatic plants in Reach 6 until spring of 2010	E-mailed on 09/25/09	USEPA approved on 09/29/2009, CBB West approved on 09/25/2009.
13	Volume 2 of 3, Document 103, Appendix B, Section 4.1, 4.4	Change in restoration monitoring periods and performance standards for woody plants.	E-mailed on 10/27/2011	USEPA approved on 01/23/2012, WBK approved on 12/29/2011.

Table 3-3
Kress Creek/West Branch DuPage River Site
Final Completion Report - Reach 7
West Chicago Environmental Response Trust
DuPage County, Illinois

Summary of Interim Change Notices (ICNs)

ICN No.	Referenced Document	Description of Change	Date Issued	Date Approved/Acknowledged by Regulators
Final Design / Remedial Action Work Plan - Reach 7				
1	Draft Reach 7 FD/RA Work Plan, Site Clearing and Haul Roads	Allowed clearing and installation of haul roads and staging areas in Reach 7.	E-mailed on 10/23/08, hard copy to be issued.	USEPA approved on 10/28/08, CBB West approved on 11/03/08.
2	Volume 1 of 2, Document 101, Appendix A-1 Engineering Drawings, Document 102, Appendix A-2 Excavation Verification Plan; and Volume 2 of 2, Document 103, Appendix B	Provides for the addition of Excavation Area Nos. R8-1 and R8-2 to the Reach 7 excavation areas	E-mailed 06/24/2010	USEPA approved on 06/28/2010, WBK approved on 06/27/2010.
3	Volume 1 of 2, Document 102, Appendix A-2, Excavation Verification Plan	Provides for the correction of the co-located drillhole associated with Drillhole 15127, and the corrected table is attached to the ICN.	E-mailed on 07/27/2010	USEPA approved on 08/10/2010, WBK approved on 08/09/2010.
4	Volume 1 of 2, Document 101, Appendix A-1, Document 102, Appendix B	ICN No. 4 (Rev. 1) presents revisions to the limits of disturbance on the site maps, incorporates seed mix changes at the request of WBK, and includes the data for the new wetland 10 that was delineated. ICN No. 4 (Rev. 1) incorporates responses to WBK's comments issued by e-mail on 08/20/2010.	E-mailed on 12/01/2010	USEPA approved on 7/28/2011, WBK approved on 01/19/2011.
5	Volume 1 of 2, Document 101, Appendix A-1, Engineering Drawings	Provides for the relocation of the rock berms and sheetpiling cofferdams in the Phase 3 area of Reach 7.	E-mailed on 12/01/2010	USEPA approved on 12/07/2010, WBK approved on 01/19/2011.
6	Volume 1 of 2, Document 101, Appendix A-1, Engineering Drawings, Drawing A-2B and; Volume 2 of 2, Appendix D, Document 105, Drawing D-4	Deletes the 4 inch to 6 inch layer of drainage stone below the articulated concrete block (ACB) mats to be installed on the downstream face of the upstream sheetpile diversion dam.	E-mailed on 07/27/2010	USEPA approved on 08/10/2010, WBK approved on 01/10/2012
7	Volume 1 of 2, Document 101, Appendix A-1, Engineering Drawings, Drawing A-2B, Drawing D-4	Deletes Big Bremme Creek bypass pumping system and instead provides for excavation of drainage channel from the mouth of Big Bremme Creek.	E-mailed on 08/12/2010	USEPA approved on 7/28/2011, WBK approved on 08/16/2010.
8	Volume 2 of 3, Document 103, Appendix B, Section 4.2	Change in restoration monitoring periods and performance standards for woody plants.	E-mailed on 10/27/2011	On 12/19/2011 WBK expressed that the Forest Preserve District only wants cages removed that are in the flood corridor of the river, not the upland areas. The only area planted with woody plants are in upland areas, therefore ICN 8 and approval are unnecessary
9	Volume 2 of 2, Document 103, Appendix B, Section 4.2	Change in planting requirements on Forest Preserve property (exchanging tree and shrub plantings for boulders); relocation of wetland plant plugs intended to be planted in Reach 7 to Reach 6; incorporation of several wetland areas in the restored main staging area; documentation of potential changes in monitoring requirements in areas disturbed by the Forest Preserve Contractor in the main staging area and adjacent haul roads.	Draft e-mailed on 01/11/2012, final version e-mailed on 02/02/2012	
Final Design / Remedial Action Work Plan - Reach 8				
1	Volume 2 of 3, Document No. 103, Appendix B, Reach Specific Restoration Plan	The ordering and planting of replacement trees and shrubs on Forest Preserve property for areas disturbed in Reach 8 in 2011 shall be suspended until further notice.	E-mailed on 07/15/2011	USEPA approved on 07/19/2011, WBK approved on 07/19/2011.
2	Volume 1 of 3, Document No. 101, Appendix A-1 Engineering Drawings	Changed access route to Pods R8-6, R8-8 and R8-9. The revised access route uses the bike trail and eliminates installing two river crossings.	E-mailed on 07/15/2011	USEPA approved on 07/19/2011, WBK approved on 07/19/2011.
3	Volume 2 of 3, Document No. 103, Appendix B, Reach Specific Restoration Plan	Revisions to restoration scope on Forest Preserve property in Reach 8.	E-mailed on 09/08/2011	USEPA approved on 09/15/2011, WBK approved on 09/08/2011.
4	Volume 1 of 3, Document No. 100, Figure 1-2, Project Organization Chart	Updated company names and individual roles on the project organization chart.	E-mailed on 09/08/2011	USEPA approved on 09/15/2011, WBK approved on 09/08/2011.
5	Volume 1 of 3, Document No. 100, Figure 3-1, Preliminary 2011 Reach 8 Schedule	Postpones the work to be completed in Pod R8-28 until the time when the three pods adjacent to Bower Elementary School (R8-25, R8-26 and R8-27) are performed.	E-mailed on 09/08/2011	USEPA approved on 09/15/2011, WBK approved on 09/08/2011.
6	Volume 2 of 3, Document No. 103, Appendix B, Reach Specific Restoration Plan, Drawing Nos. B-10B, B-10C, B-10F and B-10G	Forest Preserve additional enhancements to restoration in Reach 8.	E-mailed on 09/14/2011	USEPA approved on 09/15/2011, WBK approved on 09/14/2011.
7	Volume 1 of 3, Document No. 100, Appendix B, Reach Specific Restoration Plan - Reach 8	Complete remedial activities at Parcel Identification Number (PIN):04-35-403-020 without obtaining access agreement.	E-mailed on 09/26/2011	USEPA approved on 09/26/2011, WBK approved on 09/26/2011.
8	Volume 1 of 3, Document No. 100, Appendix B, Reach Specific Restoration Plan, Section 2.2, Traffic Control	Update traffic control plan as it relates to the trucking routes to and from the REF to Excavation Areas R8-3, R8-4 and R8-40.	E-mailed on 09/27/2011	USEPA approved on 09/28/2011, WBK approved on 09/28/2011.
Common Scoping and Planning Documents				
1	400, BBL HASP	Updated BBLES' Health & Safety Plan, primarily adding new loss prevention system sections and quicklime handling.	Posted on website for regulatory review on 04/13/06, hard copies issued on 4/27/06.	N/A
2	New Document 900	Targeted Material Stabilization Plan	Posted on website for regulatory review on 04/13/06, hard copies issued on 4/27/06.	USEPA 4/14/06, CBB West 3/28/06
3	401, Sevenson HASP	Updated Sevenson's Health & Safety Plan, adding quicklime handling procedures and loss prevention updates.	Posted on website for regulatory review on 04/13/06, hard copies issued on 4/27/06.	N/A
4	New SOP 226 for Real Time Monitoring	SOP - 226 Operation of the TSI Model 8520 Dust Trak Aerosol Monitor	Posted on website for regulatory review on 04/13/06, hard copies issued on 4/27/06.	USEPA 01/22/08, CBB West 11/01/06.
5	WCP Nos. 607, 611, 632 and 652.	Incorporation of former Kerr-McGee WCP's into the Common Planning and Scoping Documents for railcar loading operations.	Hard copies issued 4/27/06	USEPA 01/22/08, CBB West 11/01/06.
6	New SOP-227, Fish Relocation Plan and SOP-228, Mussel Relocation Plan	New SOPs added to the Common Documents package for Fish Relocation and Mussel Relocation	Hard copies issued 5/5/06	USEPA 01/22/08, CBB West 11/01/06.
7	WCP 320 Radioactive Material Shipments	Updated WCP 320 to current CFR, and includes trucking requirements from excavation site to REF.	Hard copies issued 8/9/06	USEPA 01/22/08, CBB West 11/01/06.
8	Table of Contents (TOC)	Updated TOC to reflect additional documents added.	Hard copies issued 8/9/06	USEPA 01/22/08, CBB West 11/01/06.
9	Document 200 - QAPP, New SOP 229	Added SOP 229 Monitoring Well and Piezometer Decommissioning and updated Table of Contents for the Common Scoping and Planning Documents	Hard copies issued 05/08/07	USEPA 01/22/08, CBB West 01/31/08.
10	Document 300 - Construction Quality Assurance Plan	Revised Section 02420 - Restoration/Mitigation	Hard copies issued 05/08/07	USEPA 01/22/08, CBB West 01/31/08.
11	Document 102, Appendix A-2 Excavation Verification Plan	Updated tables from Consent Decree to current	E-mailed on 12/13/07, hard copies issued on 12/21/07,	USEPA 01/22/08, CBB West 01/31/08.
12	WCP Nos. 607, 611, 632 and 652.	Deleted WCP 607 as non-applicable, updated WCPs 611, 632 and 652.	Hard copies issued 02/07/08.	USEPA 06/10/08, CBB West 06/10/08.
13	Document 400, 401 and 500	Updated Arcadis & Sevenson HASPS and Emergency Contingency Plan	E-mailed on 04/17/08, hard copies issued on 04/23/08	USEPA 06/10/08, CBB West 06/10/08.
14	Document 200 - QAPP, New SOP 230	SOP-230, Tree Tagging and Tracking	E-mailed Revision 1 on 11/07/08.	USEPA 10/28/08, CBB West 10/27/08.
15	Document 200 - QAPP, Appendix B SOPs, WCPs 611, 617, 632 & 652	Revised Appendix B SOPs and WCPs 611, 617, 632 and 652.	E-mailed on 04/15/2011	USEPA 01/23/2012, WBK 04/18/2011.
16	Document 200 - QAPP, WCP 330	Revised Table of Contents and added WCP 330 into Appendix of the Common Scoping and Planning Documents	E-mailed on 09/08/2010	USEPA 09/15/2011, WBK 09/16/2011.
17	Document 102, Appendix A-2, Excavation Verification Plan for All Reaches	Excavation boundary and excavation interior tables and drawings.	E-mailed on 10/27/2011	USEPA 01/23/2012, WBK 12/29/2011.
18	Document 400, 401 - ARCADIS and Sevenson HASP	Updated ARCADIS & Sevenson HASPs to bring them up to date	E-mailed on 09/08/2010	USEPA 09/15/2011, WBK 09/16/2011.
19	Document 200 - QAPP, WCP 345	Added Special Work Instructions for WCP 345	E-mailed on 09/08/2011	USEPA 09/15/2011, WBK 09/16/2011.
20	Document 301, Construction Quality Assurance Project Plan, Attachment A: Specifications	Revised Section 02200 of the CQAP to include Work Instruction for Response to Sinking/Rutting Equipment	Emailed on 09/29/2011	USEPA 10/27/2011, WBK 09/30/2011.
21	Document 200, Quality Assurance Project Plan, Appendix B	Railcar covers can be stacked 6 high	Emailed on 10/26/2011	USEPA 10/27/2011, WBK 10/27/2011.

Table 8-1
Kress Creek/West Branch DuPage River Site
Final Completion Report - Reach 7
West Chicago Environmental Response Trust
DuPage County, Illinois

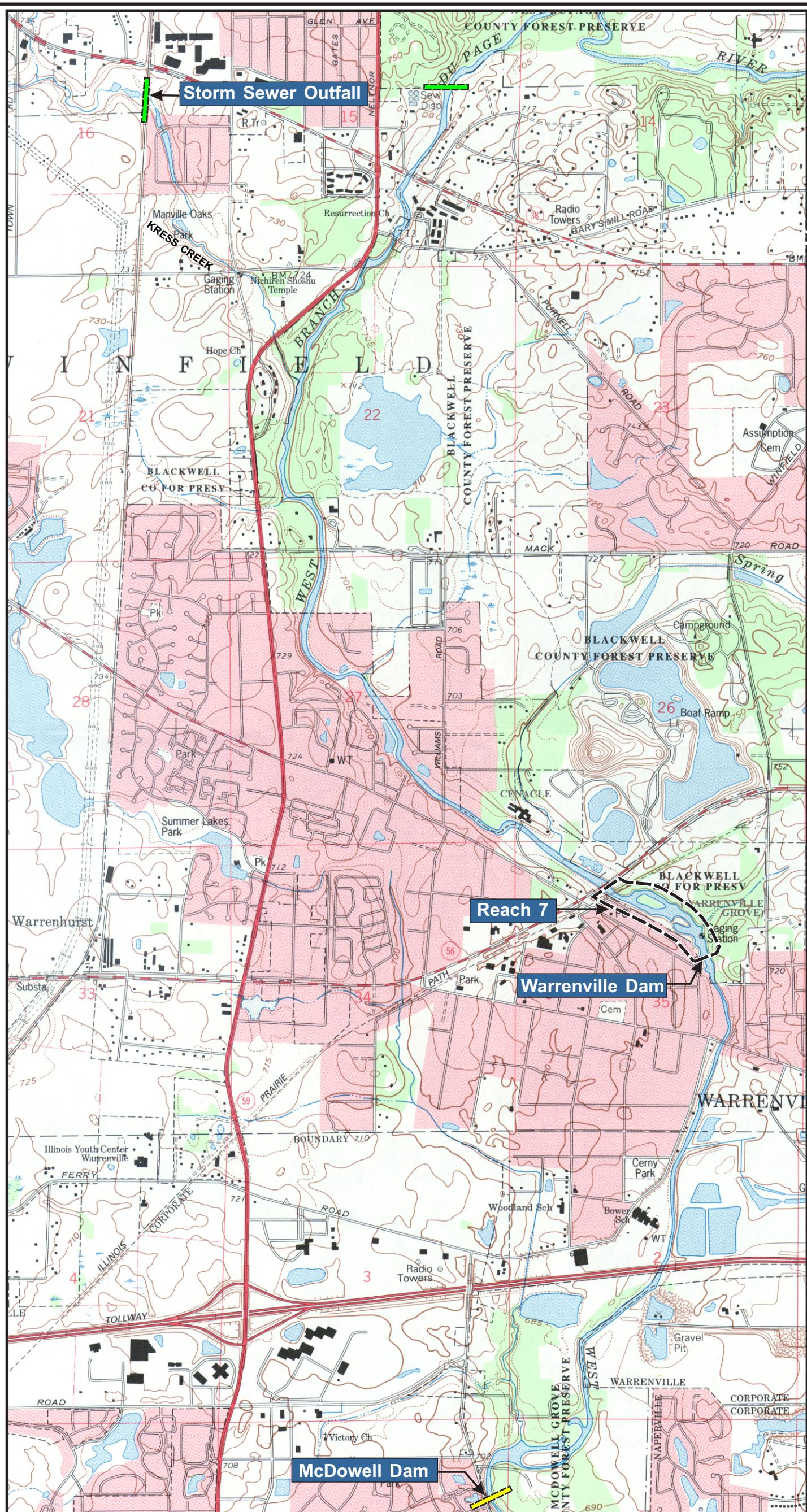
Summary of Monitoring Requirements in Reach 7

Habitat or Structure	Number or Quantity	Monitoring Endpoint	Monitoring Methodology	Performance Standard	Restoration Metric	Number of Herbaceous Vegetation Monitoring Plots	Monitoring Duration
Banks	1200 ft	Stability	Visual monitoring	Visual stability	Visual stability	NA	3 years
Wetlands	0.5 acres	% Cover; Vegetation metrics; Woody plant survival	Vegetation data collection plots; Surviving woody plant counts	90% Cover; \leq 15% cover of invasive weeds; 90% woody plant survival	Increase in Mean C, FQI, and RIV _N from year 1 to year 3; Minimum Mean C of 3.5 in third year; No areas >0.5 square meter void of vegetation; 3 most dominant species must NOT be non-native or invasive species	5	3 years
Open Floodplain Plant Community	2.7 acres	% Cover; Vegetation metrics; Woody plant survival	Vegetation data collection plots; Surviving woody plant counts	90% Cover; \leq 15% cover of invasive weeds; 90% woody plant survival	Increase in Mean C, FQI, and RIV _N from year 1 to year 3; Minimum Mean C of 3.5 in third year; No areas >0.5 square meter void of vegetation; 3 most dominant species must NOT be non-native or invasive species	27	3 years
Upland Savanna Plant Community	0.2 acres	% Cover; Vegetation metrics; Woody plant survival	Vegetation data collection plots; Surviving woody plant counts	90% Cover; \leq 5% cover of invasive weeds; 90% woody plant survival	Increase in Mean C, FQI, and RIV _N from year 1 to year 3; Minimum Mean C of 3.5 in third year; No areas >0.5 square meter void of vegetation; 3 most dominant species must NOT be non-native or invasive species	2	3 years
Upland Prairie Plant Community	0.9 acres	% Cover; Vegetation metrics; Woody plant survival	Vegetation data collection plots; Surviving woody plant counts	90% Cover; \leq 15% cover of invasive weeds; 90% woody plant survival	Increase in Mean C, FQI, and RIV _N from year 1 to year 3; Minimum Mean C of 3.5 in third year; No areas >0.5 square meter void of vegetation; 3 most dominant species must NOT be non-native or invasive species	9	3 years

Notes:

1. Banks are monitored during low flow conditions.
2. Vegetation monitoring is primarily performed in the summer, with supplemental monitoring conducted in the spring and/or fall, if needed.

Figure

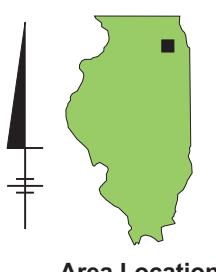


REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., NAPERVILLE, ILL., 1993.

2000' 0 2000'
Approximate Scale: 1" = 2000'

LEGEND:

- = Upstream Limit
- = Downstream Limit



WEST CHICAGO ENVIRONMENTAL RESPONSE TRUST
KRESS CREEK/WEST BRANCH DUPAGE RIVER SITE
FINAL COMPLETION REPORT
REACH 7

SITE LOCATION MAP

 ARCADIS



Appendix A

File Index of Project Documents (on attached CD)

Kress Creek
File Index
(Retention Period is lifetime per Kerr-McGee Legal Department)

- 1.0 General and Administrative
 - 1.1 General Correspondence
 - 1.2 Reports and Meeting Notes
 - 1.3 Legal
 - 1.3-1 Department of Justice
 - 1.3-2 NRD Issues
 - 1.3-3 Karagainus &White
 - 1.4 Government
 - 1.4-1 U. S. EPA
 - 1.4-1-1 Correspondence
 - 1.4-1-2 Consent Decree
 - 1.4-1-2-1 Administrative Order for RS/FS
 - 1.4-1-3 Unilateral Administration Order (UAO)
 - 1.4-1-4 Work Plan Review Comments
 - 1.4-1-5 Data Transmittal
 - 1.4-2 Previous Investigations
 - 1.4-2-1 1995 GPS Survey
 - 1.4-2-2 1993 GPS Survey
 - 1.4-3 City of West Chicago
 - 1.4-4 IEMA (formerly IDNS)**
 - 1.4-5 Illinois Dept. of Natural Resources
 - 1.4-6 DuPage County Dept. of Environmental Concerns
 - 1.4-7 Illinois Historic Preservation Agency
 - 1.4-8 DuPage County Forest Preserve (Research Permit)
 - 1.4-9 Corp. of Engineers
 - 1.4-10 Illinois Department of Transportation
 - 1.4-11 West Chicago Park District – Manville Oaks
 - 1.4-12 The Cenacle
 - 1.4-13 Department of the Army
 - 1.4-14 Permits

Kress Creek
File Index
(Retention Period is lifetime per Kerr-McGee Legal Department)

- 1.4-15 Communities/Christopher B. Burke Engineering
 - 1.4-15-1 Correspondence
 - 1.4-15-2 Environmental Studies
- 1.4-16 City of Warrenville
- 1.4-17 Illinois Environmental Protection Agency (IEPA)
- 1.5 Daily/Weekly Activity Reports
- 1.6 Insurance
- 1.7 Utilities
 - 1.7-1 EJ & E Railroad
- 1.8 Health and Safety
 - 1.8-1 Accident Reports***
 - 1.8-2 Safety Meetings***
 - 1.8-3 Vehicle Inspections***
 - 1.8-4 Site Safety Tour/Inspections***
- 1.9 Personnel Records (Including original attendance sheets)
 - 1.9-1 Training Materials***
 - 1.9-2 Job Descriptions***
- 1.10 Public Relations
 - 1.10-1 Newspaper Articles
- 1.11 Site Administration (***Reference: Scope & Planning Docs.***)
- 1.12 Quality System
 - 1.12-1 Review Meetings***
 - 1.12-2 System Reviews/Audits***
 - 1.12-3 NCR's/CAR's (Logs)***
- 2.0 Accounting and Finance
 - 2.1 Cost Estimates
 - 2.1-1 Kerr-McGee
 - 2.1-2 Contractors
 - 2.2 AFE's
 - 2.3 Cost Accounting

Kress Creek
File Index
(Retention Period is lifetime per Kerr-McGee Legal Department)

- 2.4 Taxes
- 2.5 Financial Audits
- 3.0 Engineering
 - 3.1 Work Plan and Specifications (Reference: Scoping and Planning Docs)
 - 3.1-1 Risk Assessment and Pre-Design Plan and Biweekly Meeting Notes
 - 3.1-2 Investigation Work Plan Documents
 - 3.1-3 Remedial Design Work Plan Documents
 - 3.1-4 Remedial Action Work Plan Documents
 - 3.2 Engineering Drawings (See 7.1 for Individual Property Plans)
 - 3.2-1 Engineering Calculations
 - 3.2.2 Cross Sections
 - 3.2.3 Verification Drawings
 - 3.2-3-1 Base of Excavation
 - 3.2-3-2 Overburden Removal
 - 3.2.4 Reports
 - 3.2.5 Characterization
 - 3.3 Contracts - Engineering
 - 3.3-1 West Central Environmental Consultants/ProSource (Correspondence)
 - 3.3-1-1 Bidder Qualification
 - 3.3-1-2 Bid Package (Including Response & Analysis)
 - 3.3-1-3 Contract & Amendments
 - 3.3-1-3-1 Work Change Request
 - 3.3-1-3-2 Progress Invoices
 - 3.3-1-4 Estimates & Forecasts
 - 3.3-1-5 Schedules
 - 3.3-1-6 Reports
 - 3.3-1-7 Characterization Report
 - 3.3-2 Weston, Inc. (Correspondence)
 - 3.3-2-1 Bidder Qualifications
 - 3.3-2-2 Bid Package (Including Response & Analysis)

**Kress Creek
File Index**
(Retention Period is lifetime per Kerr-McGee Legal Department)

- 3.3-2-3 Contract & Amendments
 - 3.3-2-3-1 Work Change Request
 - 3.3-2-3-2 Progress Invoices
- 3.3-2-4 Estimates & Forecasts
- 3.3-2-5 Schedules
- 3.3-2-6 Reports
- 3.3-3 R. H. Anderson (Correspondence)
 - 3.3-3-1 Bidder Qualifications
 - 3.3-3-2 Bid Package (Including Response & Analysis)
 - 3.3-3-3 Contract & Amendments
 - 3.3-3-3-1 Work Change Request
 - 3.3-3-3-2 Progress Invoices
 - 3.3-3-4 Estimates & Forecasts
 - 3.3-3-5 Schedules
 - 3.3-3-6 Reports
- 3.3-4 Independent Testing Support - (Correspondence)
 - 3.3-4-1 TSC
 - 3.3-4-2 Hazen
 - 3.3-4-3 Lancaster
- 3.3-5 T.L. Rice Inc. (Correspondence)
 - 3.3-5-1 Bidder Qualification (Resume')
 - 3.3-5-3 Contracts and Amendments
 - 3.3-5-6 Reports
- 3.3-6 BBL Inc. (Correspondence)
 - 3.3-6-1 Bidder Qualifications
 - 3.3-6-2 Bid Package (Including Response and Analysis)
 - 3.3-6-3 Contract and Amendments
 - 3.3-6-3-1 Change Orders (Work Changes)
 - 3.3-6-3-2 Invoices
 - 3.3-6-4 Reach Specific Alternatives Evaluation Report (RSAE)

Kress Creek
File Index
(Retention Period is lifetime per Kerr-McGee Legal Department)

- 3.3-6-4-1 Comments to RSAE Report
- 3.3-6-5 Conceptual Design Report
 - 3.3-6-5-1 Comments to Conceptual Design Report
 - 3.3-6-5-2 Reach 8 Addendum
- 3.3-6-6 Conceptual Restoration Plan
 - 3.3-6-6-1 Comments to Conceptual Restoration Plan
- 3.3-6-7 Reports
 - 3.3-6-7-1 Transportation Plan
 - 3.3-6-7-2 ARARS
- 3.3-6-8 Detailed Design
 - 3.3-6-8-1 Engineering Calculations
 - 3.3-6-8-2 Drawings
 - 3.3-6-8-3 FEQ Modeling
 - 3.3-6-8-4 Operation and Maintenance
- 3.3-6-9 RI/FS
 - 3.3-6-9-1 Remedial Investigation/Comments
 - 3.3-6-9-2 Feasibility Study
- 3.4 Previous Investigations (Pre-1997)
- 3.5 Field Investigation (1997 to current)
 - 3.5-1 Surface Gamma Survey
 - 3.5-1-1 Field Data
 - 3.5-1-2 Maps
 - 3.5-2 Shallow Soil Test Holes
 - 3.5-2-1 1997 Borehole Field Logs
 - 3.5-2-2 1998 Borehole Field Logs
 - 3.5-2-3 1999 Borehole Field Logs
 - 3.5-2-4 2000 Borehole Field Logs
 - 3.5-2-5 2001 Borehole Field Logs
 - 3.5-2-6 2002 Borehole Field Logs
 - 3.5-2-7 Soil Boring Log Sheets

Kress Creek

File Index

(Retention Period is lifetime per Kerr-McGee Legal Department)

- 3.5-2-8 Radiological Lab Data
 - 3.5-2-9 Land Surveying
 - 3.5-2-10 Field Maps
 - 3.5-2-11 Borehole Logging Master Spreadsheets & Checkprints
 - 3.5-2-12 Underwater Soil Sample (Hazen)
 - 3.5-2-13 Daily Summary
 - 3.5-3 Deep Soil Borings
 - 3.5-3-1 Soil Boring Logs
 - 3.5-3-2 Downhole Gamma Logging
 - 3.5-3-3 Geotechnical Soil Testing
 - 3.5-3-4 Radiological Lab Data
 - 3.5-3-5 Land Surveying
 - 3.5-3-6 Field Maps
 - 3.5-4 Piezometers/Staff Gauges/Stream Flow/Surface Water
 - 3.5-4-1 Soil Boring Logs
 - 3.5-4-2 Borehole Field Logs
 - 3.5-4-3 Radiological Lab Data
 - 3.5-4-4 Land Surveying
 - 3.5-4-5 Water Level Field Data
 - 3.5-4-6 Stream Flow Calculations
 - 3.5-4-7 Field Maps
 - 3.5-4-8 Chain of Custody
 - 3.5-4-9 Water Analysis (Manville OAKS Park Pond)
 - 3.5-4-10 Sediment Sampling
 - 3.5-5 Field Log Books
 - 3.5-6 Aerial Photos
 - 3.5-7 Weston Tree Study
 - 3.5-8 Weston Wetlands Maps for West Branch DuPage River
- 3.6 Data Output ARCHIVE - Including all extensions thru 3.6-3
- 4.0 Construction

Kress Creek
File Index
(Retention Period is lifetime per Kerr-McGee Legal Department)

- 4.1 BBL (Correspondence)
 - 4.1-1 Bidder Qualification (See 3.3-6-1)
 - 4.1-2 Bid Package (See 3.3-6-2)
 - 4.1-3 Contracts & Amendments
 - 4.1-3-1 Change Orders (Work Changes)
 - 4.1-3-2 Invoices
 - 4.1-3-3 Submittals
 - 4.1-4 Schedules
 - 4.1-5 Reports
 - 4.1-5-1 Manpower Estimate & Forecast
 - 4.1-5-2 QC Field Reports
 - 4.1-5-3 Safety/Incident Reports
 - 4.1-5-4 Turnover Documents
 - 4.1-6 Verification Data
 - 4.1-6-1** *Verf., Maps, and Data (Bottom of OB and BP)*
 - 4.1-6-2** *Field Logbooks*
 - 4.1-6-3** *Calibration Records (Raw Data GPS)*
 - 4.1-7 Maintenance Inspection Reports
- 4.2 Miscellaneous Contracts (RD-n-P Drilling)
- 5.0 Procurement - Purchase Orders (Filed numerically with approval documents, bid evaluation, receiving reports, specs, etc)
 - 5.1 Contractor Procurement and Meetings
 - 5.1-1 Property or Equipment Loss - Inventory
 - 5.2 Kerr-McGee Procurement
 - 5.3 Vendor List
- 6.0 Health Physics
 - 6.1 Air Monitoring
 - 6.2 Survey Data
 - 6.2-1 Backfill Sample Analysis – Report (Sources)
 - 6.3 Instrument/Equipment Calibrations and Quality Assurance (H.P. 17.0000)
 - 6.4 Respiratory Protection Program Maintenance

Kress Creek
File Index
(Retention Period is lifetime per Kerr-McGee Legal Department)

- 6.5 Dosimetry Monitoring Data
- 6.6 Safe Work Permits
- 6.7 Downhole and Gamma Logging
 - 6.7-1 Bridges - Westwind Division
- 6.8 Water Survey
- 6.9 Training
- 7.0 Property Completions
 - 7.1 Work Orders
 - 7.1-1 Parcel Folders (access agreements, photographs, etc.)
 - 7.2 Access Agreements
 - 7.3 Bills of Lading
 - 7.4 Materials Handled (Overburden Verification)
 - 7.5 Invoices
 - 7.6 Radiological Sampling and Data Verifications (Soil Samples)
 - 7.6-1 Excavation Depth Verifications
 - 7.7 Notifications / Verification Release from U.S. EPA
 - 7.8 Acceptance from City of West Chicago
 - 7.9 Property Video Survey
- 8.0 Closure Report



Appendix B

Summary Table of “GPS Points Achieved” Issued for the Bottoms of Overburden and Targeted Materials for Reaches 7 (on attached CD)

Appendix B

Summary Table of "GPS Points Achieved" Issued for the Bottoms of Overburden and Targeted Material for Reach 7

Reach Area	Points Achieved Date	Package Delivery Date and Method
R8-2	6/25/10	6/25/10 via e-mail
R8-2	7/2/10	7/2/10 via e-mail
R7-1	7/10/10	7/12/10 via e-mail
R8-1	7/13/10	7/14/10 via e-mail
R7-1	8/13/10	8/14/10 via e-mail
R7-1	8/16/11	8/17/10 via e-mail
R7-3	8/17/10	8/18/10 via e-mail
R7-3	8/18/10	8/19/10 via e-mail
R7-3	8/19/10	8/20/11 via e-mail
R7-3	8/20/10	8/22/10 via e-mail
R7-3	8/23/10	8/24/10 via e-mail
R7-3	8/24/10	8/25/10 via e-mail
R7-3	8/25/10	8/26/10 via e-mail
R7-3	8/26/10	8/27/10 via e-mail
R7-3	8/27/10	8/29/10 via e-mail
R7-3	8/28/10	8/30/10 via e-mail
R7-2 & R7-3	8/30/10	8/31/10 via e-mail
R7-3	8/31/10	9/1/10 via e-mail
R7-3	9/2/10	9/3/10 via e-mail
R7-3	9/7/10	9/8/10 via e-mail
R7-3	9/8/10	9/9/10 via e-mail
R7-3	9/9/10	9/10/10 via e-mail
R7-3	9/10/10	9/13/10 via e-mail, Rev. 9/16/10
R7-3	9/13/10	9/14/10 via e-mail
R7-2 & R7-3	9/14/10	9/15/10 via e-mail
R7-3	9/15/10	9/16/10 via e-mail
R7-3	9/16/10	9/17/10 via e-mail
R7-3	9/17/10	9/18/10 via e-mail
R7-3	9/18/10	9/20/10 via e-mail
R7-3	9/20/10	9/21/10 via e-mail
R7-3	9/21/10	9/22/10 via e-mail
R7-3	9/22/10	9/23/10 via e-mail
R7-3	9/23/10	9/24/10 via e-mail
R7-3	9/24/10	9/25/10 via e-mail
R7-3	9/25/10	9/27/10 via e-mail
R7-3	9/27/10	9/28/10 via e-mail
R7-3	9/28/10	9/29/10 via e-mail
R7-3	9/29/10	9/30/10 via e-mail
R7-3	10/4/10	10/5/10 via e-mail
R7-3	10/5/10	10/6/10 via e-mail
R7-3	10/6/10	10/7/10 via e-mail
R7-3	10/7/10	10/8/10 via e-mail
R7-3	10/8/10	10/11/10 via e-mail
R7-3	10/9/10	10/11/10 via e-mail
R7-3	10/11/10	10/12/10 via e-mail
R7-3	10/12/10	10/13/10 via e-mail
R7-3	10/13/10	10/14/10 via e-mail
R7-3	10/14/10	10/14/10 via e-mail
R7-3	10/29/10	11/1/10 via e-mail
R7-3	10/30/10	11/1/10 via e-mail
R7-3	11/1/10	11/2/10 via e-mail

Appendix B

Summary Table of "GPS Points Achieved" Issued for the Bottoms of Overburden and Targeted Material for Reach 7

Reach Area	Points Achieved Date	Package Delivery Date and Method
R7-3	11/2/10	11/3/10 via e-mail
R7-3	11/3/10	11/5/10 via e-mail
R7-3	11/4/10	11/8/10 via e-mail
R7-3	11/5/10	11/8/10 via e-mail
R7-3	11/6/10	11/8/10 via e-mail
R7-3	11/8/10	11/9/10 via e-mail
R7-3	11/9/10	11/9/10 via e-mail

Distribution Initiator:

Michael Savage, ARCADIS
Joe Kotwicki, ARCADIS

Distribution List:

Glen Anderson, Tronox
Jeffery Williams, Shaw
Timothy Fischer, USEPA
Kelly Grahn, IEMA
Steve Shafer, REM/IEMA
Rob Maddox, Canberra
John Wills, WBK Associates
Jamie Geils, WBK Associates
Lacey Lawrence, WBK Associates

Mark Gravelding, ARCADIS
Elizabeth Razawich, ARCADIS
Anthony Esposito, ARCADIS
Rick Elia Jr., Sevenson
Marty Folan, Sevenson
Ricky Moss, Sevenson
Doug Coble, Sevenson
Amy Ruta, Sevenson
Vinny Fracassi, Sevenson
Sean Crumes, Sevenson
Wade Carlson, Carlson PSI
Jerry Krane, Carlson PSI
Dan Ryan, Carlson PSI



Appendix C

Memorandum of Understanding
Regarding the Notching of the
Warrenville Dam and Constructing a
Historic River Channel Rock Blanket

MEMORANDUM OF UNDERSTANDING
REGARDING THE NOTCHING OF THE WARRENVILLE DAM
AND CONSTRUCTING A HISTORIC RIVER CHANNEL ROCK BLANKET

Kress Creek/West Branch Remedial Action Project

DuPage County, Illinois

This Memorandum of Understanding is entered into by and between Tronox, LLC (formerly known as Kerr McGee Chemical LLC), (hereinafter referred to as "Tronox"), and ARCADIS U.S., Inc. (hereinafter referred to as "ARCADIS"), and the Forest Preserve District of DuPage County (hereinafter referred to as the "District"), and documents the assumed facts and conditions under which ARCADIS, on behalf of Tronox, will perform the notching of the Warrenville Dam owned by the District and construct an aggregate channel bed comprised of mixed glacial outwash of cobbles, gravels and sands throughout the historic flow channel of the West Branch DuPage River north of the Warrenville Dam extending from the upstream diversion dam to the Warrenville Dam and will be approximately 70 feet wide by 18 inches in depth (herein referred to as the "Rock Blanket") in conjunction with the remedial action activities that will be performed in Reach 7 of the Kress Creek/West Branch of the DuPage River Remedial Action Project.

Pursuant to the Local Communities Consent Decree previously executed between Tronox and the District on March 31, 2005 and entered as a final judgment on April 20, 2005 in the Federal District Court for the Northern District of Illinois and inclusive of all exhibits and attachments thereto and pursuant to the "Memorandum of Understanding by and between Tronox, LLC and the Forest Preserve District of DuPage County" executed in July of 2006 (MOU of 2006), both of which are incorporated herein by reference and made part of this Memorandum of Understanding, the District and Tronox agree that notching the Warrenville Grove Dam and constructing the Rock Blanket shall be considered a river restoration enhancement under the terms and procedures for performing "Addendum Restoration Work."

ARCADIS has been informed that the District has plans to modify the Warrenville Dam, which includes lowering its profile, as part of ongoing enhancements that the District is undertaking along the West Branch DuPage River corridor. It is ARCADIS' understanding that the District intends to initiate and complete the dam modification work as soon as ARCADIS completes the remedial action activities in Reach 7, which encompasses the West Branch of the DuPage River from Butterfield Road south to the Warrenville Dam.

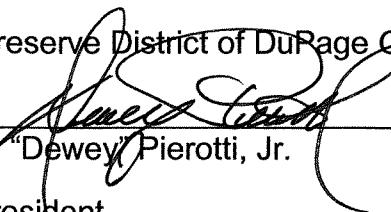
ARCADIS has also been informed that the District desires to construct river channel habitat improvements as part of ongoing enhancements that the District is undertaking in the West Branch DuPage River corridor. It is ARCADIS' understanding that the District intends to initiate and complete river channel habitat improvements using the Rock Blanket aggregates as foundational materials as soon as ARCADIS completes the remedial action activities in Reach 7, which encompasses the West Branch of the DuPage River from Butterfield Road south to the Warrenville Dam.

This Memorandum of Understanding is being issued to provide written confirmation that:

1. The District has made the decision to modify the profile of the Warrenville Dam and ARCADIS, at the request of its client, Tronox, has agreed to undertake the initial step in this effort – notching the dam (i.e., lowering the profile of a smaller portion of the dam) in conjunction with ARCADIS' remedial action activities in Reach 7.
2. The District intends to begin the final dam modification work at the Warrenville Dam upon the completion of ARCADIS' remedial action activities in Reach 7.
3. Upon completion of the remedial action activities in Reach 7 by ARCADIS in accordance with the Reach 7 Final Design/Remedial Action (FD/RA) Work Plan, the District shall accept responsibility for the notched Warrenville Dam.
4. The District has made the decision to construct river channel habitat improvements to the river channel north of the Warrenville Dam and ARCADIS, at the request of its client, Tronox, has agreed to undertake the initial step in this effort – constructing the Rock Blanket in conjunction with ARCADIS' remedial action activities in Reach 7.
5. The District intends to begin the final river channel habitat improvements within the material of the Rock Blanket upon the completion of ARCADIS' remedial action activities in Reach 7.
6. Upon completion of the remedial action activities in Reach 7 by ARCADIS in accordance with the Reach 7 FD/RA Work Plan, the District shall accept responsibility for the Rock Blanket.
7. The District and Tronox agree that notching the Warrenville Dam and constructing the Rock Blanket shall be the final "Addendum Restoration Work" between the parties and is further agreed to be valued at the remainder of the "Tree Fund" dollar credits owed to the District through work on Reach 7 and the area of disturbance on Reach 8. Per the terms of the MOU of 2006, the final "Addendum Restoration Work" leaves the Tree Fund exhausted and balanced at zero.
8. In association with installation of the Rock Blanket, the District shall pay to ARCADIS a sum of \$250,000 as full compensation for purchasing and transporting to the site the aggregates necessary to construct the Rock Blanket, in accordance with the MOU of 2006 in which the District will provide certain materials to be used for "Addendum Restoration Work."

IN WITNESS WHEREOF, the parties have entered into this Memorandum of Understanding as of the date of the last signatory as set forth below.

Forest Preserve District of DuPage County:

By: 
D. "Dewey" Pierotti, Jr.
President

DATE: _____, 2010

Attest: _____

Tronox LLC:

MATTHEW PAQUE 
Print Name Signature
Associate Staff Counsel 6/25/2010
Title Date

ARCADIS:

RICHARD DIFIORE 
Print Name Signature
Sr. Vice President 6/23/2010
Title Date



Appendix D

Water Column Monitoring Data
Summary for Reach 7 (on attached
CD)

Appendix D
Water Column Monitoring Data Summary for Reach 7

Date	Reach	Time	Upstream Butterfield Road (NTU)	Upstream R7 Tributary (NTU)	Downstream Warrenville Road Bridge (NTU)	Downstream - Upstream Δ NTU
6/1/10	R7	n/a		Non-operating day: No sample required.		
6/2/10	R7	n/a		Non-operating day: No sample required.		
6/3/10	R7	n/a		Non-operating day: No sample required.		
6/4/10	R7	n/a		Non-operating day: No sample required.		
6/5/10	R7	n/a		Non-operating day: No sample required.		
6/6/10	R7	n/a		Non-operating day: No sample required.		
6/7/10	R7	n/a		Non-operating day: No sample required.		
6/8/10	R7	n/a		Non-operating day: No sample required.		
6/9/10	R7	n/a		Non-operating day: No sample required.		
6/10/10	R7	n/a		Non-operating day: No sample required.		
6/11/10	R7	n/a		Non-operating day: No sample required.		
6/12/10	R7	n/a		Non-operating day: No sample required.		
6/13/10	R7	n/a		Non-operating day: No sample required.		
6/14/10	R7	n/a		Non-operating day: No sample required.		
6/15/10	R7	n/a		Non-operating day: No sample required.		
6/16/10	R7	n/a		Non-operating day: No sample required.		
6/17/10	R7	n/a		Non-operating day: No sample required.		
6/18/10	R7	n/a		Non-operating day: No sample required.		
6/19/10	R7	n/a		Non-operating day: No sample required.		
6/20/10	R7	n/a		Non-operating day: No sample required.		
6/21/10	R7	n/a		Non-operating day: No sample required.		
6/22/10	R7	n/a		Non-operating day: No sample required.		
6/23/10	R7	n/a		Non-operating day: No sample required.		
6/24/10	R7	n/a		Non-operating day: No sample required.		
6/25/10	R7	n/a		Non-operating day: No sample required.		
6/26/10	R7	n/a		Non-operating day: No sample required.		
6/27/10	R7	n/a		Non-operating day: No sample required.		
6/28/10	R7	n/a		Non-operating day: No sample required.		
6/29/10	R7	n/a		Non-operating day: No sample required.		
6/30/10	R7	pm	118.0	n/a	93.0	-25.0
7/1/10	R7	am	75.0	n/a	86.8	11.8
		pm	89.3	n/a	92.1	2.8
7/2/10	R7	am	57.6	n/a	58.3	0.7
		pm	65.5	n/a	68.3	2.8
7/3/10	R7	n/a		Non-operating day: No sample required.		
7/4/10	R7	n/a		Non-operating day: No sample required.		
7/5/10	R7	n/a		Non-operating day: No sample required.		
7/6/10	R7	am	56.4	n/a	78.7	22.3
		pm	78.0	n/a	79.5	1.5
7/7/10	R7	am	41.7	n/a	64.0	22.3
		pm	78.0	n/a	81.4	3.4
7/8/10	R7	am	63.2	n/a	78.9	15.7
		pm	91.0	n/a	98.8	7.8
7/9/10	R7	am	88.7	n/a	95.6	6.9
		pm	84.6	n/a	92.6	8.0
7/10/10	R7	am	56.7	n/a	65.5	8.8
		pm	58.9	n/a	66.3	7.4

Appendix D
Water Column Monitoring Data Summary for Reach 7

Date	Reach	Time	Upstream Butterfield Road (NTU)	Upstream R7 Tributary (NTU)	Downstream Warrenville Road Bridge (NTU)	Downstream - Upstream Δ NTU
7/11/10	R7	am	40.2	n/a	44.4	4.2
		pm	50.2	n/a	52.4	2.2
7/12/10	R7	am	101.5	n/a	113.5	12.0
		pm	73.4	n/a	87.4	14.0
7/13/10	R7	am	71.5	n/a	80.2	8.7
		pm	50.1	n/a	69.3	19.2
7/14/2010*	R7	8:55	66.4	n/a	140.3	73.9
		9:32	95.3	n/a	198.2	102.9
		10:45	n/a	n/a	367.0	n/a
		12:00	n/a	n/a	336.0	n/a
		13:05	n/a	n/a	268.0	n/a
		13:50	170.0	n/a	263.0	93.0
		14:30	176.0	n/a	126.0	-50.0
7/15/10	R7	am	111.0	n/a	78.6	-32.4
		pm	126.0	n/a	125.0	-1.0
7/16/10	R7	am	100.0	n/a	114.0	14.0
		pm	121.0	n/a	131.0	10.0
7/17/10	R7	am	52.0	n/a	61.0	9.0
		pm	55.0	n/a	64.0	9.0
7/18/10	R7	am	70.0	n/a	76.0	6.0
		pm	65.0	n/a	73.0	8.0
7/19/10	R7	am	60.0	n/a	48.0	-12.0
		pm	52.0	n/a	42.0	-10.0
7/20/10	R7	am	89.0	n/a	97.0	8.0
		pm	180.0	n/a	110.0	-70.0
7/21/10	R7	am	93.0	n/a	52.2	-40.8
		pm	215.0	n/a	225.0	10.0
7/22/10	R7	am	80.0	n/a	108.0	28.0
		pm	75.0	n/a	78.0	3.0
7/23/10	R7	am	101.0	n/a	99.0	-2.0
		pm	212.0	n/a	235.0	23.0
7/24/10	R7	n/a			Non-operating day: No sample required.	
7/25/10	R7	n/a			Non-operating day: No sample required.	
7/26/10	R7	n/a			Non-operating day: No sample required.	
7/27/10	R7	n/a			Non-operating day: No sample required.	
7/28/10	R7	n/a			Non-operating day: No sample required.	
7/29/10	R7	n/a			Non-operating day: No sample required.	
7/30/10	R7	am	60.8	n/a	55.0	-5.8
		pm	65.2	n/a	67.2	2.0
7/31/10	R7	am	48.4	n/a	72.3	23.9
		pm	172.0	n/a	198.0	26.0
8/1/10	R7	n/a			Non-operating day: No sample required.	
8/2/10	R7	am	97.0	n/a	90.3	-6.7
		pm	113.0	n/a	93.4	-19.6
8/3/10	R7	n/a			Non-operating day: No sample required.	
8/4/10	R7	n/a			Non-operating day: No sample required.	

* For details about this exceedance see Section 4 of the Quality Control Daily Report #2010-025

Appendix D
Water Column Monitoring Data Summary for Reach 7

Date	Reach	Time	Upstream Butterfield Road (NTU)	Upstream R7 Tributary (NTU)	Downstream Warrenville Road Bridge (NTU)	Downstream - Upstream \triangle NTU
8/5/10	R7	n/a			Non-operating day: No sample required.	
8/6/10	R7	n/a			Non-operating day: No sample required.	
8/7/10	R7	n/a			Non-operating day: No sample required.	
8/8/10	R7	n/a			Non-operating day: No sample required.	
8/9/10	R7	n/a			Non-operating day: No sample required.	
8/10/10	R7	am	90.2	n/a	64.7	-25.5
		pm	432.0	n/a	447.0	15.0
8/11/10	R7	am	72.0	n/a	72.5	0.5
		pm	71.2	n/a	87.2	16.0
8/12/10	R7	am	79.4	n/a	62.4	-17.0
		pm	73.2	n/a	70.6	-2.6
8/13/10	R7	am	97.3	n/a	79.8	-17.5
		pm	56.0	n/a	68.0	12.0
8/14/10	R7	am	151.3	n/a	143.7	-7.6
		pm	95.2	n/a	123.3	28.1
8/15/10	R7	am	220.0	n/a	242.0	22.0
		pm	249.0	n/a	245.0	-4.0
8/16/10	R7	am	68.7	n/a	86.7	18.0
		pm	78.0	n/a	99.1	21.1
8/17/10	R7	am	118.0	n/a	115.0	-3.0
		pm	120.0	n/a	128.0	8.0
8/18/10	R7	am	165.0	n/a	159.0	-6.0
		pm	173.0	n/a	162.0	-11.0
8/19/10	R7	am	61.5	n/a	64.1	2.6
		pm	93.2	n/a	75.1	-18.1
8/20/10	R7	am	40.2	n/a	25.0	-15.2
		pm	10.5	n/a	4.7	-5.8
8/21/10	R7	am	60.4	n/a	64.1	3.7
		pm	63.4	n/a	63.8	0.4
8/22/10	R7	am	47.8	n/a	48.6	0.8
		pm	32.4	n/a	29.7	-2.7
8/23/10	R7	am	32.2	n/a	51.8	19.6
		pm	39.5	n/a	22.3	-17.2
8/24/10	R7	pm	10.0	n/a	1.4	-8.6
8/25/10	R7	am	44.5	n/a	27.7	-16.8
8/26/10	R7	pm	37.3	n/a	28.9	-8.4
8/27/10	R7	pm	10.3	n/a	5.2	-5.1
8/28/10	R7	pm	10.2	n/a	8.4	-1.8
8/29/10	R7	am	7.2	n/a	5.2	-2.0
8/30/10	R7	am	17.4	n/a	15.3	-2.1
8/31/10	R7	am	22.5	n/a	22.0	-0.5
9/1/10	R7	am	21.0	n/a	12.0	-9.0
9/2/10	R7	pm	5.8	n/a	11.3	5.5
9/3/10	R7	am	81.0	n/a	82.0	1.0
9/4/10	R7	am	117.9	n/a	132.6	14.7
9/5/10	R7	am	92.8	n/a	106.4	13.6
9/6/10	R7	am	73.6	n/a	88.9	15.3
9/7/10	R7	pm	5.0	n/a	5.5	0.5

Appendix D
Water Column Monitoring Data Summary for Reach 7

Date	Reach	Time	Upstream Butterfield Road (NTU)	Upstream R7 Tributary (NTU)	Downstream Warrenville Road Bridge (NTU)	Downstream - Upstream \triangle NTU
9/8/10	R7	pm	47.6	n/a	36.0	-11.6
9/9/10	R7	pm	24.0	n/a	36.8	12.8
9/10/10	R7	pm	11.0	n/a	9.9	-1.1
9/11/10	R7	am	10.0	n/a	24.9	14.9
9/12/10	R7	pm	17.2	n/a	19.4	2.2
9/13/10	R7	pm	15.6	n/a	24.2	8.6
9/14/10	R7	pm	88.3	n/a	76.5	-11.8
9/15/10	R7	pm	17.2	n/a	18.1	0.9
9/16/10	R7	am	268.0	n/a	156.0	-112.0
9/17/10	R7	am	75.0	n/a	78.0	3.0
9/18/10	R7	pm	24.6	n/a	19.3	-5.3
9/19/10	R7	am	236.0	n/a	240.0	4.0
9/20/10	R7	pm	232.0	n/a	228.0	-4.0
9/21/10	R7	pm	127.0	n/a	125.0	-2.0
9/22/10	R7	pm	194.0	n/a	207.0	13.0
9/23/10	R7	am	288.0	n/a	301.0	13.0
9/24/10	R7	pm	346.0	n/a	356.0	10.0
9/25/10	R7	am	324.0	n/a	329.0	5.0
9/26/10	R7	am	327.0	n/a	322.0	-5.0
9/27/10	R7	am	417.0	n/a	382.0	-35.0
9/28/10	R7	am	421.0	n/a	432.0	11.0
9/29/10	R7	am	358.0	n/a	370.0	12.0
9/30/10	R7	am	14.4	n/a	15.0	0.6
10/1/10	R7	am	416.8	n/a	425.8	9.0
10/2/10	R7	am	422.0	n/a	448.0	26.0
10/3/10	R7	am	366.0	n/a	381.0	15.0
10/4/10	R7	am	245.0	n/a	254.0	9.0
10/5/10	R7	am	287.0	n/a	290.0	3.0
10/6/10	R7	am	328.0	n/a	334.0	6.0
10/7/10	R7	am	342.0	n/a	351.0	9.0
10/8/10	R7	am	307.0	n/a	290.0	-17.0
10/9/10	R7	am	9.6	n/a	8.1	-1.5
10/10/10	R7	pm	9.2	n/a	7.3	-1.9
10/11/10	R7	pm	7.4	n/a	4.6	-2.8
10/12/10	R7	am	10.1	n/a	9.6	-0.5
10/13/10	R7	am	364.0	n/a	339.0	-25.0
10/14/10	R7	pm	10.2	n/a	9.2	-1.0
10/15/10	R7	am	13.2	n/a	11.7	-1.5
10/16/10	R7	am	6.4	n/a	9.3	2.9
10/17/10	R7	am	11.0	n/a	15.1	4.1
10/18/10	R7	am	13.4	n/a	11.9	-1.5
10/19/10	R7	am	8.1	n/a	10.6	2.5
10/20/10	R7	am	16.3	n/a	30.7	14.4
10/21/10	R7	am	13.5	n/a	32.2	18.7
10/22/10	R7	am	17.2	n/a	32.6	15.4
10/23/10	R7	am	11.9	n/a	24.3	12.4
10/24/10	R7	pm	20.2	n/a	31.4	11.2
10/25/10	R7	am	15.8	n/a	28.6	12.8
10/26/10	R7	am	13.3	n/a	32.2	18.9

Appendix D
Water Column Monitoring Data Summary for Reach 7

Date	Reach	Time	Upstream Butterfield Road (NTU)	Upstream R7 Tributary (NTU)	Downstream Warrenville Road Bridge (NTU)	Downstream - Upstream \triangle NTU
10/27/10	R7	am	21.7	n/a	29.7	8.0
10/28/10	R7	am	38.7	n/a	64.4	25.7
10/29/10	R7	am	61.5	n/a	31.4	-30.1
10/30/10	R8	am	41.7	n/a	38.5	-3.2
10/31/10	R7	am	11.4	n/a	23.1	11.7
11/1/10	R7	am	16.5	n/a	27.2	10.7
11/2/10	R7	am	25.2	n/a	24.6	-0.6
11/3/10	R7	am	22.5	n/a	21.7	-0.8
11/4/10	R7	am	17.7	n/a	23.8	6.1
11/5/10	R7	am	27.0	n/a	25.5	-1.5
11/6/10	R7	am	31.0	n/a	26.0	-5.0
11/7/10	R7	am	77.5	n/a	26.7	-50.8
11/8/10	R7	am	50.7	n/a	32.9	-17.8
11/9/10	R7	am	86.7	n/a	76.1	-10.6
11/10/10	R7	am	48.0	n/a	44.3	-3.7
11/11/10	R7	n/a	Non-operating day: No sample required.			
11/12/10	R7	n/a	Non-operating day: No sample required.			
11/13/10	R7	n/a	Non-operating day: No sample required.			
11/14/10	R7	n/a	Non-operating day: No sample required.			
11/15/10	R7	am	65.7	n/a	53.2	-12.5
		pm	44.8	n/a	38.7	-6.1
11/16/10	R7	am	60.7	n/a	50.8	-9.9
		pm	34.8	n/a	31.5	-3.3
11/17/10	R7	n/a	No sampling required: No in-river activity (See Note 1).			
11/18/10	R7	n/a	N/A			
11/19/10	R7	n/a	N/A			
11/20/10	R7	n/a	N/A			

Note 1: All in-river construction activities for the 2010 remedial construction season were completed on 11/16/2010. No further water column monitoring was performed.

Note 2: From 9/19/2010 through 10/08/2010, turbidity levels reported were recorded at unusually high levels. After further investigation, it was determined that the meter was not properly calibrated. In every case, differences between upstream and downstream readings remained under 50 NTU.



Appendix E

Notification of Successful GPS
Verification Survey for the Bottoms of
Overburden, Reach 7 – All Sections
(R7-1 through R7-3) (on attached
CD)

KC 204

Mr. Glen Anderson
Tronox LLC
800 Weyrauch Street
West Chicago, Illinois 60185

gfw 1-3-11

ARCADIS
800 Weyrauch Street
West Chicago
Illinois 60185
Tel 630.293.7695
Fax 630.293.7719
www.arcadis-us.com

Subject:

Notification of Successful GPS Verification Survey

For the Bottom of Overburden - Reach 7

Kress Creek/West Branch of the DuPage River Remedial Action Project
DuPage County, Illinois

Environmental

Date:
January 3, 2011

Dear Glen:

Contact:
Michael F. Savage

In accordance with Section 2.1.5.2 – Notification in the *Reach 7 Final Design/Remedial Action Work Plan* (FD/RA Work Plan) for the above-referenced project, ARCADIS U.S., Inc. (ARCADIS) is pleased to notify Tronox LLC, the United States Environmental Protection Agency (USEPA) RPM/OSC, the Illinois Emergency Management Agency (IEMA) and the Local Communities' Representative (WBK Associates) that a successful Global Positioning System (GPS) Verification Survey was performed for the **Bottom of Overburden** for the excavations for the entirety of **Reach 7 (and Excavation Areas R8-1 and R8-2 in Reach 8)** at the Kress Creek/West Branch DuPage River Remedial Action Project located in West Chicago (DuPage County), Illinois at the time and date noted below:

Cell Phone:
630.235.1423

Email:
Michael.Savage@arcadis-us.com

Our ref:
B0071034.0000

1. This GPS Verification Survey Package issued on January 3, 2011 includes for the entirety of Reach 7 and Excavation Areas R8-1 and R8-2 in Reach 8 the overburden points achieved and documented in accordance with the Work Plan. The survey data for these GPS verification points for bottom of overburden in Reach 7 and Excavation Areas R8-1 and R8-2 in Reach 8 were previously distributed by a series of e-mails entitled "GPS Points Achieved" that were sent from June 25, 2010 through November 9, 2010.

Excavation Locations: Reach 7: Sections R7-1 through R7-3, and in Reach 8 Excavation Areas R8-1 and R8-2.

Date of Verification: January 3, 2011

In accordance with Section 2.1.5.1 – Concurrent Verification of the FD/RA Work Plan, ARCADIS sent an e-mail each week with a weekly schedule for the next week that listed the projected locations and dates where excavations and GPS Verification Surveys would be performed. ARCADIS sent those weekly schedule e-mails to Tim Fischer of the USEPA; Gary McCandless, Kelly Grahn, and Steve Shafer of IEMA/DNS; and John Wills and Jamie Geils of WBK Associates providing them the required 24-hour notice that the excavations and GPS Verification Surveys for the bottom of overburden material in the above-listed areas would be completed during those weeks.

The attached Excel file prepared by Carlson PSI includes a separate table entitled *Kress Creek/ West Branch DuPage River Verification Points, Bottom of Overburden* for each of the three sections that comprise Reach 7 and for Excavation Areas R8-1 and R8-2 in Reach 8, and the tables list the design, actual, and difference of the survey coordinates and elevations of the verification points in each section.

The attached PDF file prepared by Carlson PSI includes eight separate PDF figures numbered 1 of 8, 2 of 8, etc., and the figures are numbered from north to south. The figures present collectively a map of the excavation locations of the 3 sections that comprise Reach 7 and Excavation Areas R8-1 and R8-2 in Reach 8, and denote the location of each of the verification points that have been verified.

The verification points listed in these attachments have been achieved and excavation of the targeted material in the specified excavation locations has proceeded in accordance with the prior preliminary verbal approval of these points based on the field monitoring of the regulators' representatives. Documents pertaining to this survey are available for inspection at the ARCADIS construction office at Tronox's REF Facility.

Sincerely,

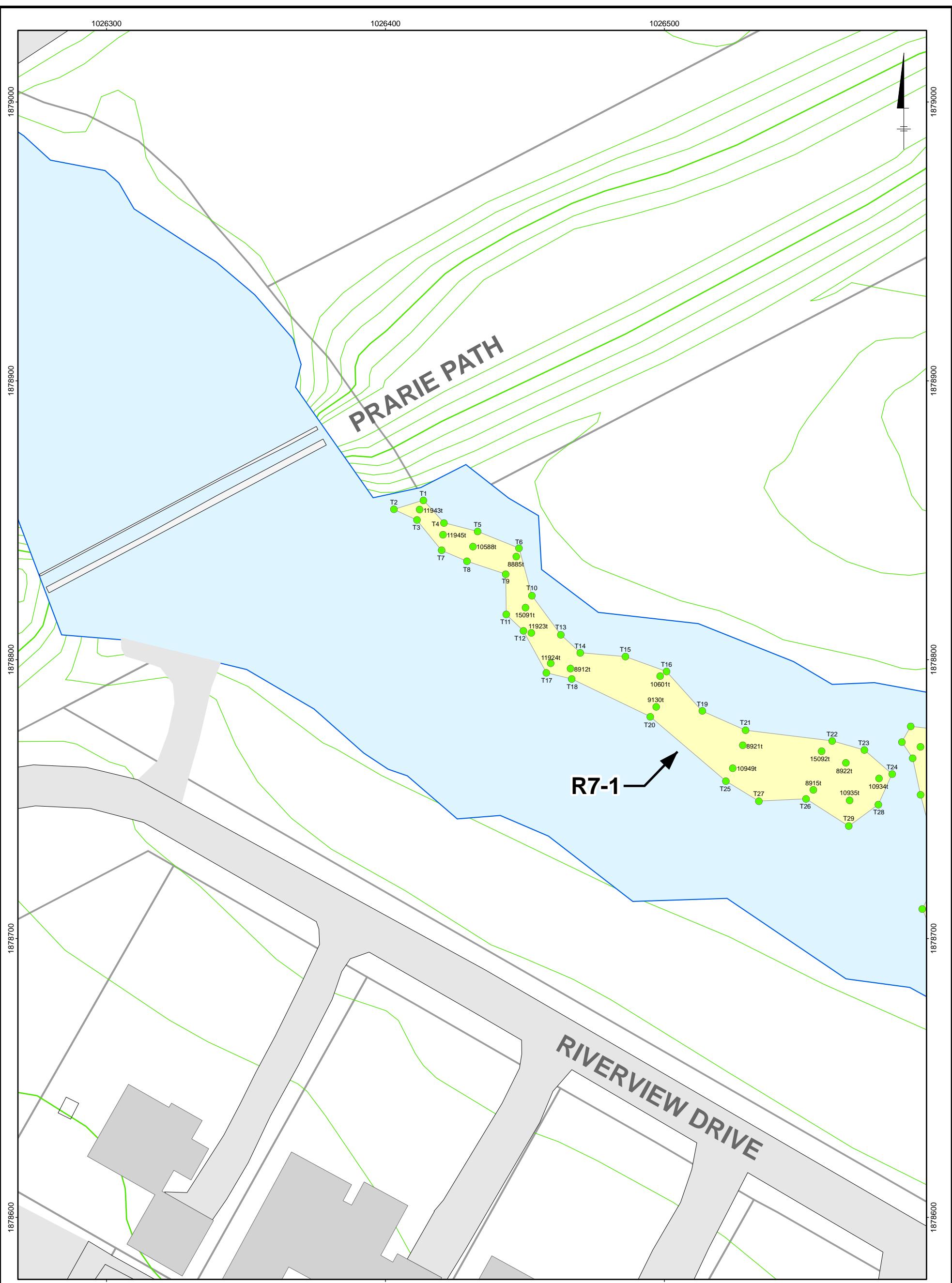
ARCADIS



Michael F. Savage
Principal Civil Engineer

Copies:

Timothy Fischer, United States Environmental Protection Agency
Glen Anderson, Tronox LLC
Jeffery Williams, Tronox LLC
Gary McCandless, IEMA
Kelly Grahn, IEMA
Steve Shafer, REM/IEMA
Jamie Geils, WBK Associates
John Wills, WBK Associates
Michael Crystal, Sevenson
Rick Elia, Jr., Sevenson
Marty Folan, Sevenson
Ricky Moss, Sevenson
Amy Ruta, Sevenson
Wade Carlson, Carlson PSI
Jerry Krane, Carlson PSI
Mark Gravelding, ARCADIS
Joseph Molina, ARCADIS
Elizabeth Razawich, ARCADIS
Heather Vandewalker, ARCADIS
Joseph Kotwicki, ARCADIS

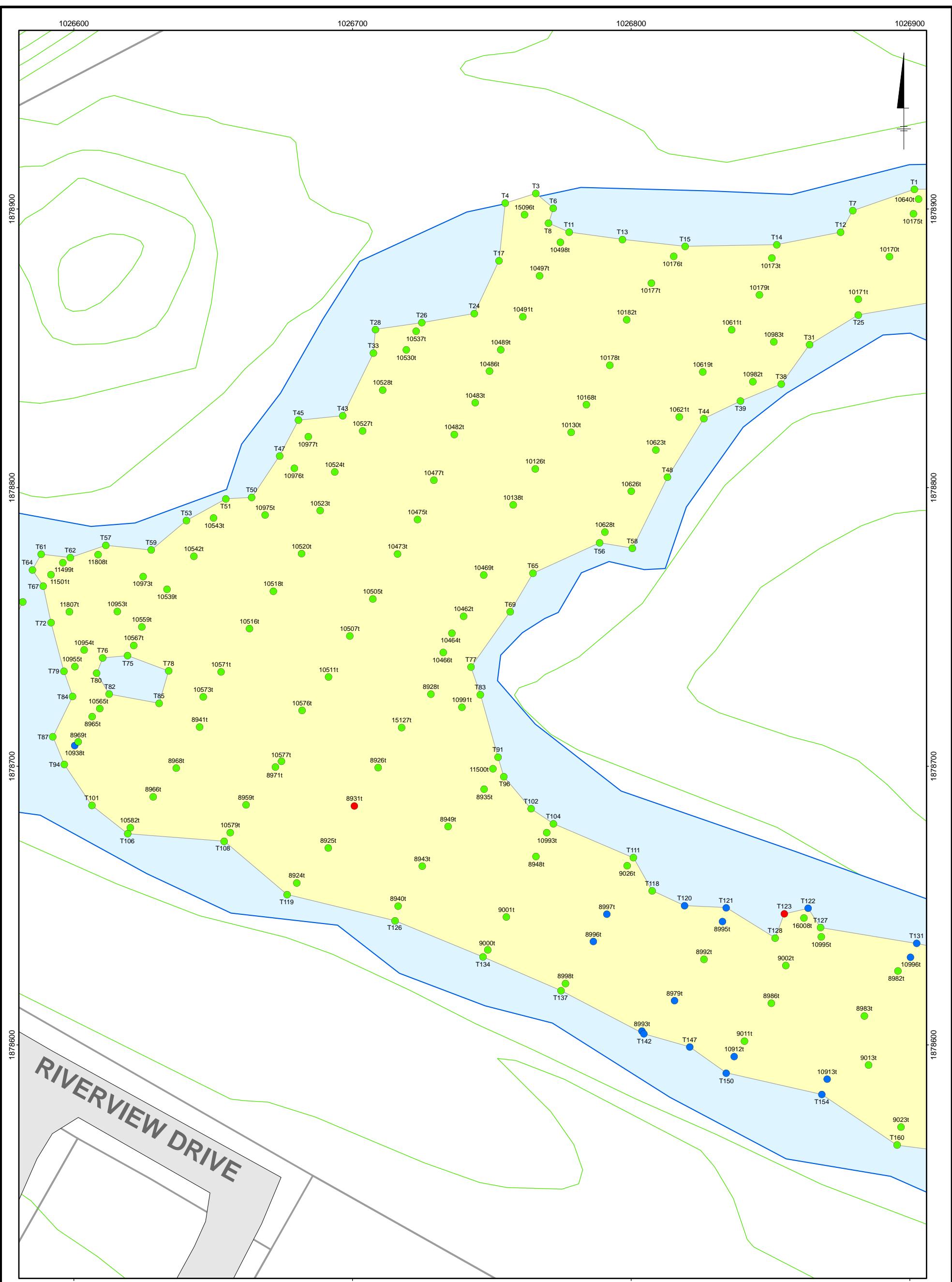


NOTE:

1. COORDINATE SYSTEM: ILLINOIS EAST STATE PLANE
DATUM: NAD 83
UNITS: FEET

TRONOX, LLC
KRESS CREEK/WEST BRANCH DUPAGE RIVER
REMEDIATION TRACKING SYSTEM
GPS VERIFICATION POINTS
BOTTOM OF OVERBURDEN
REACH 7
(Figures Numbered North to South)




LEGEND:

- 10 FOOT TOPOGRAPHIC CONTOUR
- 2 FOOT TOPOGRAPHIC CONTOUR
- PROPERTY LINE

0 25 50 Feet

DATE: 12/28/2010

PREPARED BY: Jerry Krane

SURVEY LOCATION:

- LOCATION NOT SURVEYED

**ELEVATION DIFFERENCE
(ACTUAL VS DESIGN)**

- > 0.5 Ft
- 0.5 to -0.25 Ft
- < -0.25 Ft

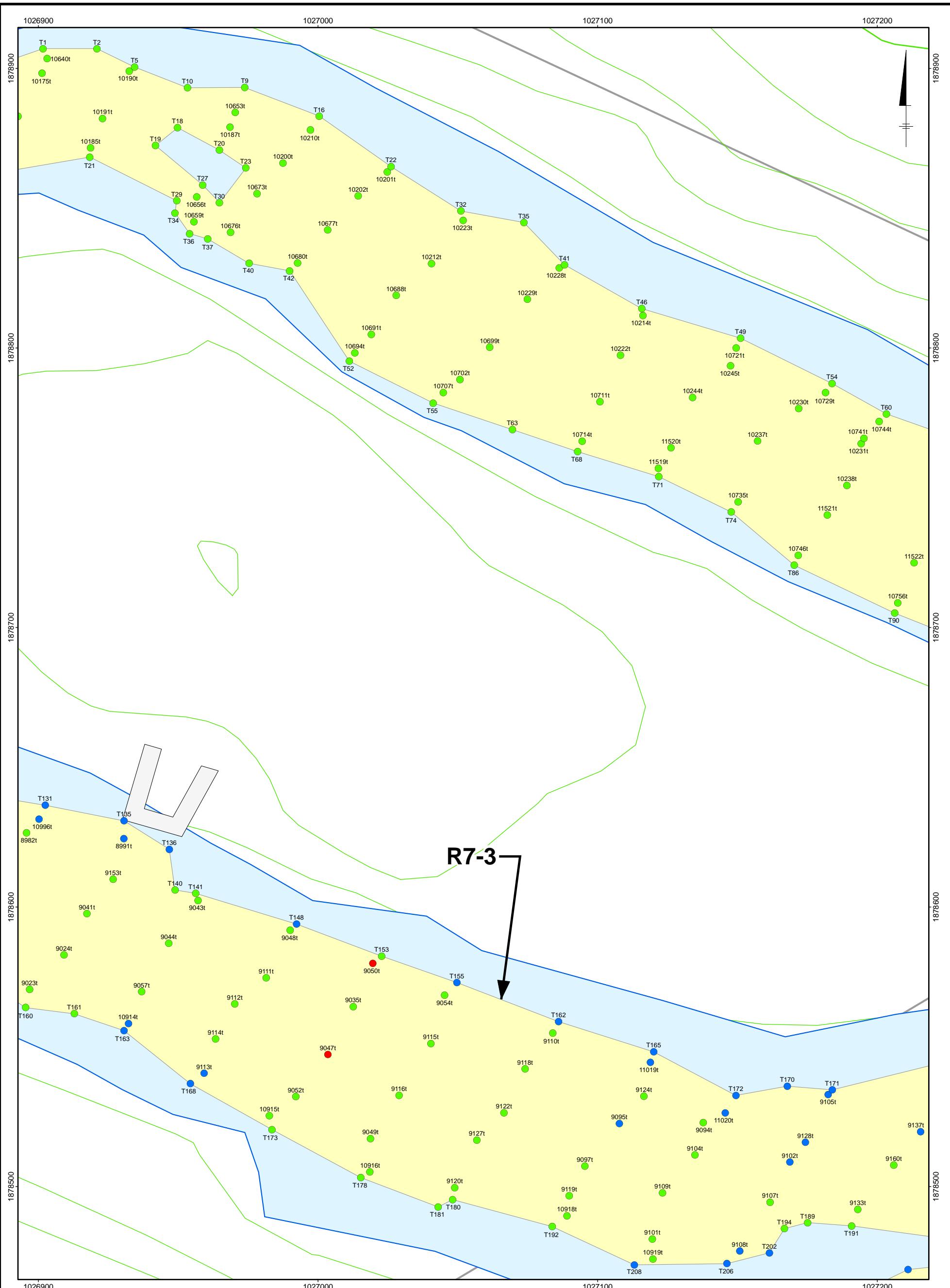
NOTE:
1. COORDINATE SYSTEM: ILLINOIS EAST STATE PLANE
DATUM: NAD 83
UNITS: FEET

TRONOX, LLC
KRESS CREEK/WEST BRANCH DUPAGE RIVER
REMEDIATION TRACKING SYSTEM

**GPS VERIFICATION POINTS
BOTTOM OF OVERBURDEN
REACH 7**
(Figures Numbered North to South)

Carlson
PROFESSIONAL SERVICES

FIGURE
2 of 8



LEGEND:

- 10 FOOT TOPOGRAPHIC CONTOUR
 - 2 FOOT TOPOGRAPHIC CONTOUR

0

DATE: 12/28/2010

SURVEY LOCATION:

○ LOCATION NOT SURVEYED

EL E V A T I O N D I F F E R E N C E (ACTUAL VS DESIGN)

- $> 0.5 \text{ Ft}$
 - $0.5 \text{ to } -0.25 \text{ Ft}$
 - $< -0.25 \text{ Ft}$

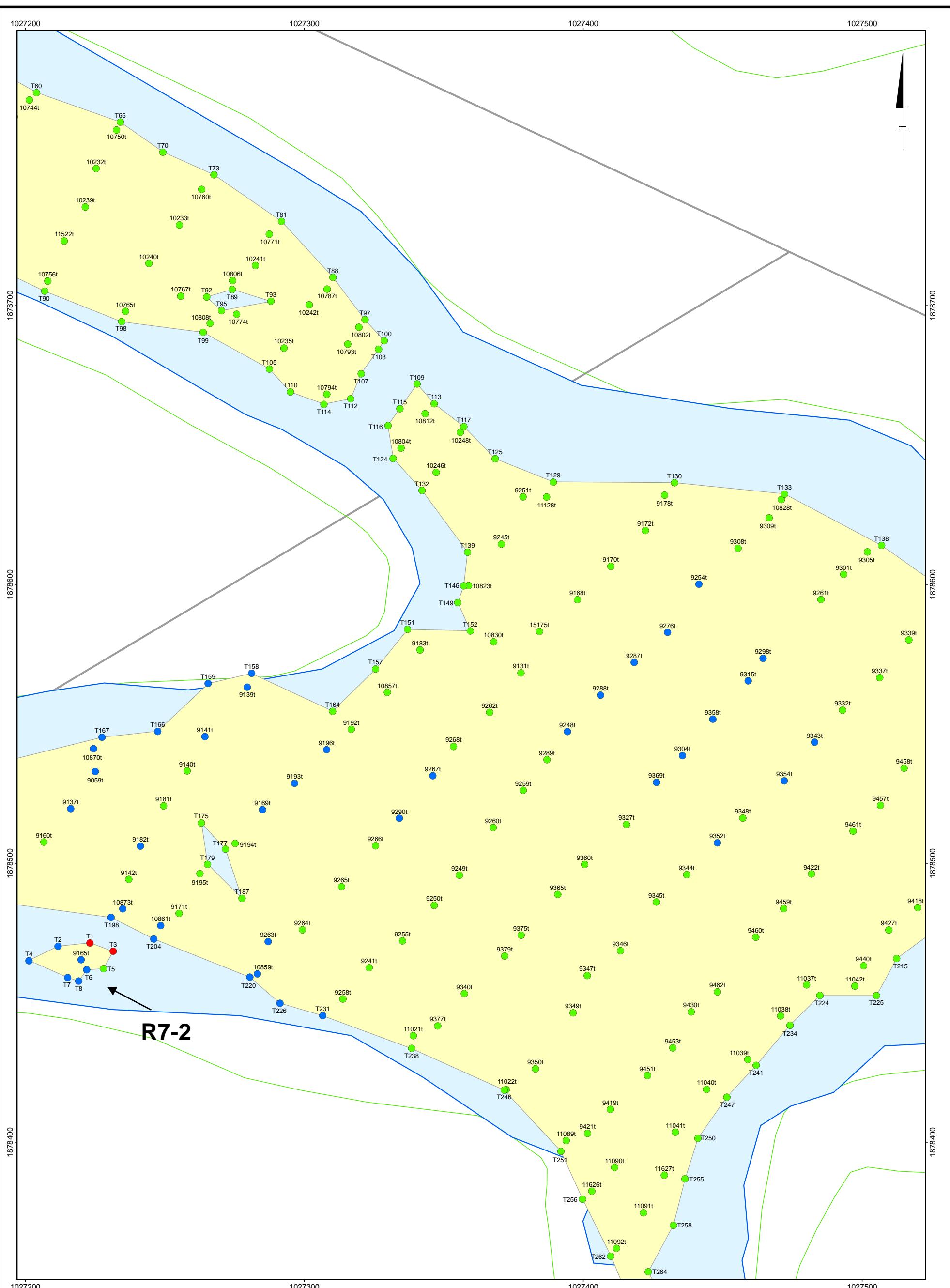
NOTE:
1. COORDINATE SYSTEM: ILLINOIS EAST STATE PLANE
DATUM: NAD 83
UNITS: FEET

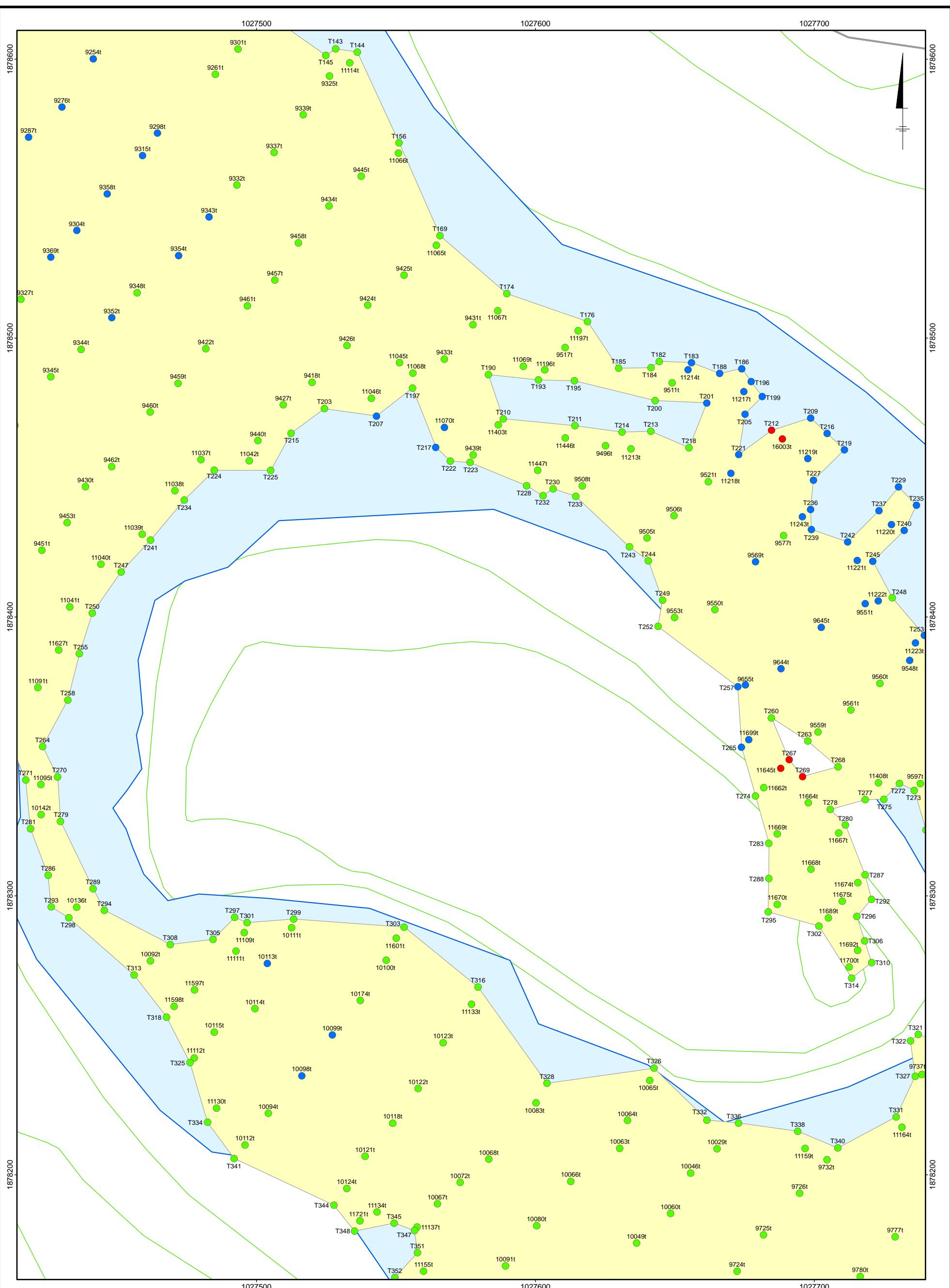
TRONOX, LLC
KRESS CREEK/WEST BRANCH DUPAGE RIVER
REMEDIATION TRACKING SYSTEM

**GPS VERIFICATION POINTS
BOTTOM OF OVERTBURDEN
REACH 7**

(Figures Numbered North to South)







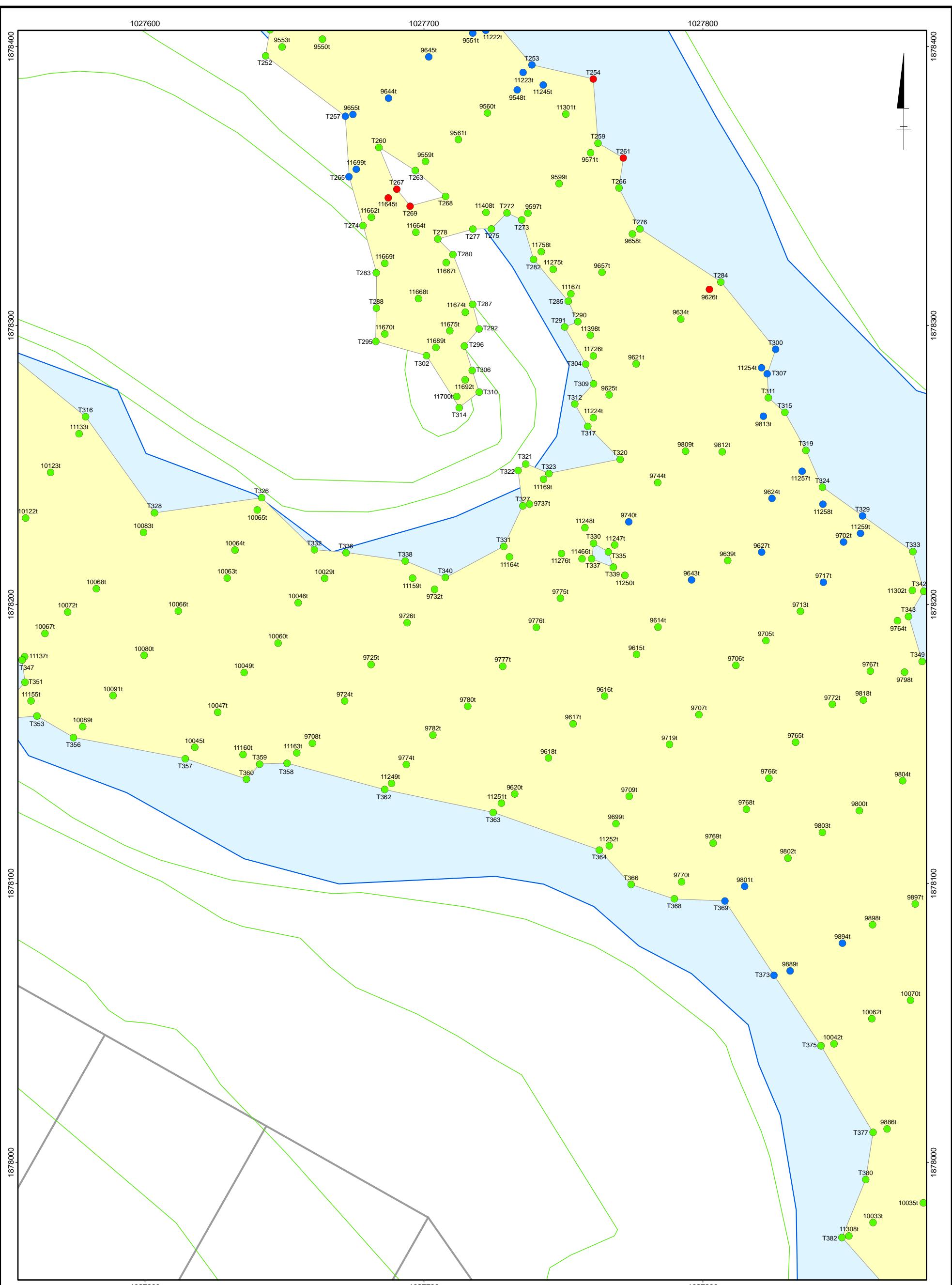
DATE: 12/28/2010

PREPARED BY: Jerry Krane

TRONOX, LLC
KRESS CREEK/WEST BRANCH DUPAGE RIVER
REMEDIATION TRACKING SYSTEM
GPS VERIFICATION POINTS
BOTTOM OF OVERBURDEN
REACH 7
(Figures Numbered North to South)

Carlson
PROFESSIONAL SERVICES

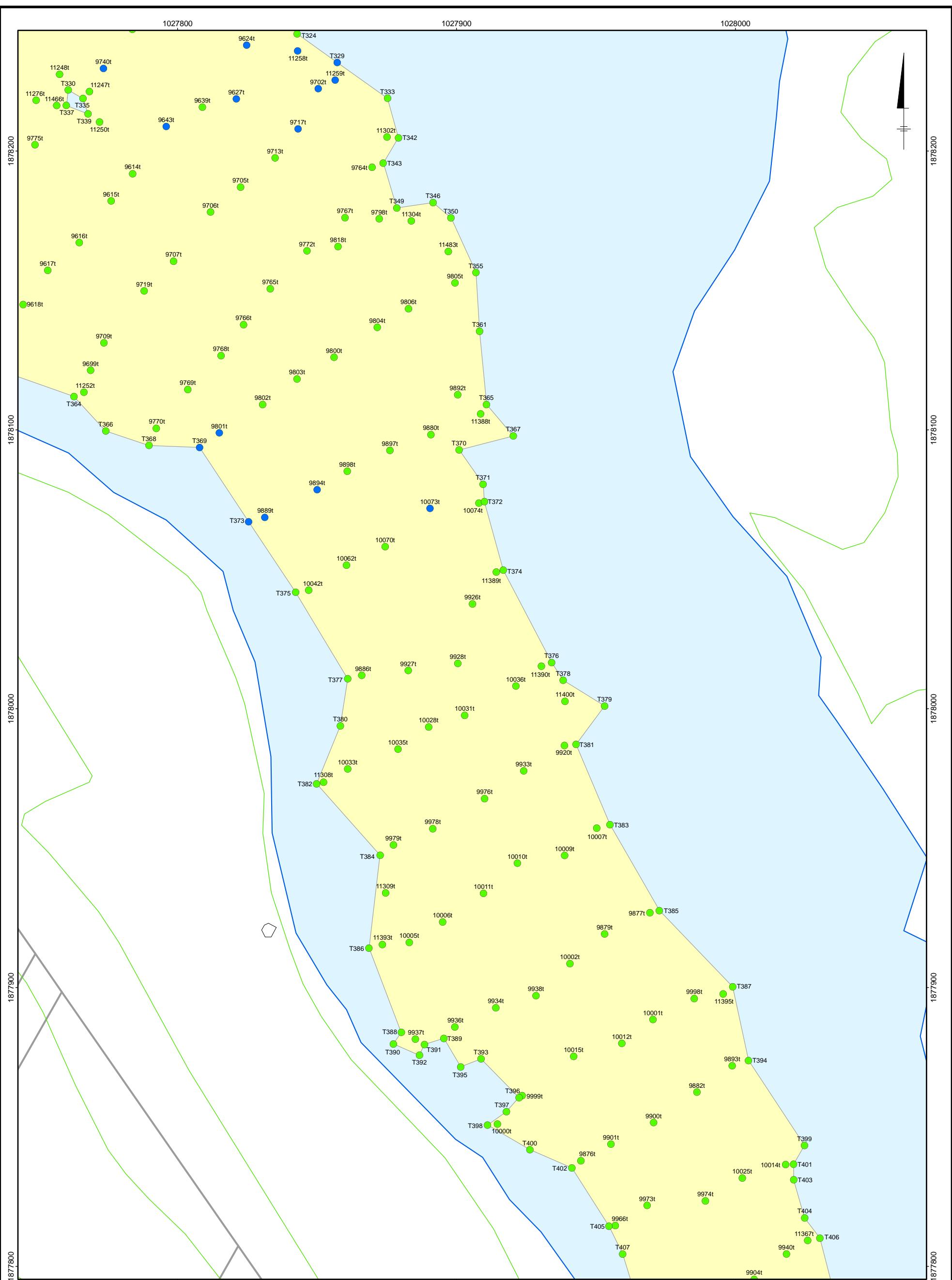
FIGURE
5 of 8



NOTE:
 1. COORDINATE SYSTEM: ILLINOIS EAST STATE PLANE
 DATUM: NAD 83
 UNITS: FEET

TRONOX, LLC
**KRESS CREEK/WEST BRANCH DUPAGE RIVER
 REMEDIATION TRACKING SYSTEM**
**GPS VERIFICATION POINTS
 BOTTOM OF OVERBURDEN
 REACH 7**
 (Figures Numbered North to South)

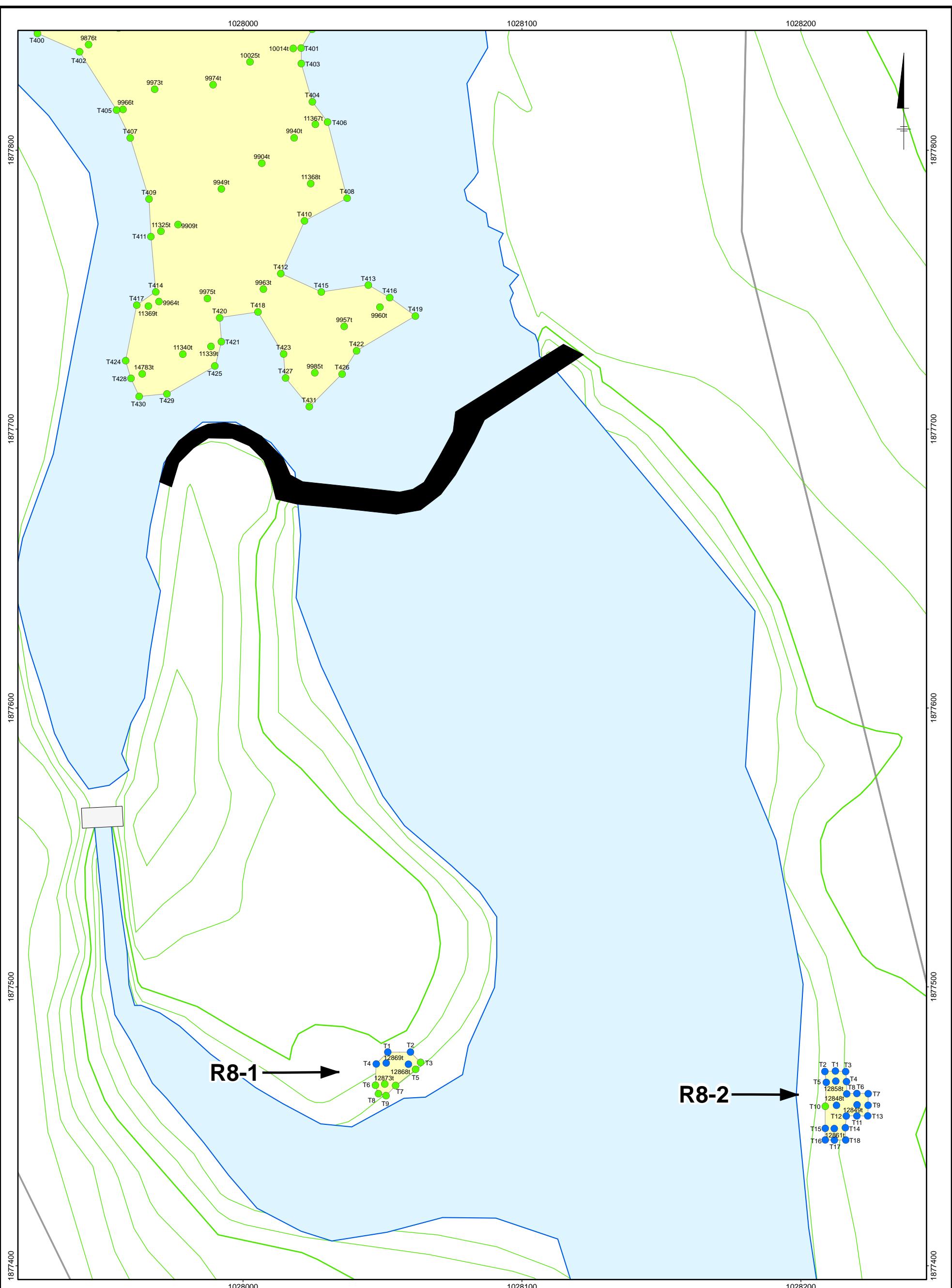




TRONOX, LLC
KRESS CREEK/WEST BRANCH DUPAGE RIVER
REMEDIATION TRACKING SYSTEM

GPS VERIFICATION POINTS
BOTTOM OF OVERBURDEN
REACH 7
(Figures Numbered North to South)

Carlson
PROFESSIONAL SERVICES



LEGEND:

- 10 FOOT TOPOGRAPHIC CONTOUR
- 2 FOOT TOPOGRAPHIC CONTOUR
- PROPERTY LINE

0 25 50 Feet

DATE: 12/28/2010

PREPARED BY: Jerry Krane

SURVEY LOCATION:
 ○ LOCATION NOT SURVEYED
ELEVATION DIFFERENCE (ACTUAL VS DESIGN)
 ● > 0.5 Ft
 ● 0.5 to -0.25 Ft
 ● < -0.25 Ft

NOTE:
 1. COORDINATE SYSTEM: ILLINOIS EAST STATE PLANE
 DATUM: NAD 83
 UNITS: FEET

TRONOX, LLC
**KRESS CREEK/WEST BRANCH DUPAGE RIVER
 REMEDIATION TRACKING SYSTEM**
**GPS VERIFICATION POINTS
 BOTTOM OF OVERBURDEN
 REACH 7**
 (Figures Numbered North to South)

Carlson
 PROFESSIONAL SERVICES

FIGURE
8 of 8

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS
 Bottom of Overburden
 Reach 7-1

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-1-10588t	1026431.300	1878840.600	687.2	1026431.357	1878840.557	687.587	0.057	-0.043	0.387	
7	R7-1-10601t	1026498.500	1878794.200	686.4	1026498.473	1878794.145	686.739	-0.027	-0.055	0.339	
7	R7-1-10934t	1026576.900	1878757.400	685.2	1026576.929	1878757.421	685.644	0.029	0.021	0.444	
7	R7-1-10935t	1026566.400	1878749.600	685.2	1026566.406	1878749.551	685.628	0.006	-0.049	0.428	
7	R7-1-10949t	1026524.500	1878761.100	684.7	1026524.486	1878761.091	685.149	-0.014	-0.009	0.449	
7	R7-1-11923t	1026452.200	1878809.700	685.0	1026452.276	1878809.625	685.331	0.076	-0.075	0.331	
7	R7-1-11924t	1026459.300	1878798.800	GS	1026459.231	1878798.722	686.006	-0.069	-0.078	NA	
7	R7-1-11943t	1026412.300	1878853.800	686.8	1026412.225	1878853.866	687.077	-0.075	0.066	0.277	
7	R7-1-11945t	1026420.700	1878844.800	687.0	1026420.626	1878844.840	687.446	-0.074	0.040	0.446	
7	R7-1-15091t	1026450.100	1878818.700	685.1	1026450.194	1878818.690	685.521	0.094	-0.010	0.421	
7	R7-1-15092t	1026556.300	1878767.300	685.8	1026556.363	1878767.205	686.212	0.063	-0.095	0.412	
7	R7-1-8885t	1026446.800	1878837.000	GS	1026446.896	1878837.008	690.282	0.096	0.008	NA	
7	R7-1-8912t	1026466.300	1878796.800	685.1	1026466.337	1878796.844	685.450	0.037	0.044	0.350	
7	R7-1-8915t	1026553.400	1878753.300	684.7	1026553.403	1878753.339	685.180	0.003	0.039	0.480	
7	R7-1-8921t	1026528.100	1878769.300	GS	1026528.083	1878769.334	685.910	-0.017	0.034	NA	
7	R7-1-8922t	1026565.000	1878763.000	GS	1026565.061	1878763.025	685.934	0.061	0.025	NA	
7	R7-1-9130t	1026497.100	1878783.100	685.1	1026497.051	1878783.087	685.502	-0.049	-0.013	0.402	
7	R7-1-T1	1026413.600	1878857.200	686.8	1026413.606	1878857.139	686.890	0.006	-0.061	0.090	
7	R7-1-T10	1026452.500	1878823.000	685.1	1026452.491	1878822.969	685.211	-0.009	-0.031	0.111	
7	R7-1-T11	1026443.300	1878816.200	685.1	1026443.292	1878816.270	685.464	-0.008	0.070	0.364	
7	R7-1-T12	1026449.400	1878810.400	685.0	1026449.465	1878810.360	685.314	0.065	-0.040	0.314	
7	R7-1-T13	1026462.900	1878808.900	685.0	1026462.850	1878808.932	685.198	-0.050	0.032	0.198	
7	R7-1-T14	1026469.900	1878802.500	685.1	1026469.829	1878802.481	685.484	-0.071	-0.019	0.384	
7	R7-1-T15	1026486.000	1878801.100	686.4	1026486.015	1878801.138	686.556	0.015	0.038	0.156	
7	R7-1-T16	1026500.700	1878795.800	686.4	1026500.769	1878795.804	686.577	0.069	0.004	0.177	
7	R7-1-T17	1026457.700	1878795.300	GS	1026457.663	1878795.308	685.717	-0.037	0.008	NA	
7	R7-1-T18	1026466.800	1878793.100	685.1	1026466.751	1878793.097	685.434	-0.049	-0.003	0.334	
7	R7-1-T19	1026513.500	1878781.600	685.1	1026513.598	1878781.661	685.489	0.098	0.061	0.389	
7	R7-1-T2	1026403.000	1878853.900	686.8	1026403.011	1878853.964	686.972	0.011	0.064	0.172	
7	R7-1-T20	1026494.900	1878779.600	685.1	1026494.915	1878779.532	685.469	0.015	-0.068	0.369	
7	R7-1-T21	1026529.100	1878774.700	GS	1026529.093	1878774.749	685.524	-0.007	0.049	NA	
7	R7-1-T22	1026560.100	1878770.900	685.8	1026560.115	1878770.860	686.186	0.015	-0.040	0.386	
7	R7-1-T23	1026571.700	1878767.600	GS	1026571.705	1878767.647	687.005	0.005	0.047	NA	
7	R7-1-T24	1026581.600	1878759.000	685.2	1026581.663	1878758.990	685.671	0.063	-0.010	0.471	
7	R7-1-T25	1026522.000	1878756.500	684.7	1026522.033	1878756.470	685.036	0.033	-0.030	0.336	
7	R7-1-T26	1026550.800	1878750.100	684.7	1026550.769	1878750.103	685.082	-0.031	0.003	0.382	
7	R7-1-T27	1026533.800	1878749.300	684.7	1026533.871	1878749.260	684.857	0.071	-0.040	0.157	

Δ Elevation > 0.5 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS
 Bottom of Overburden
 Reach 7-1

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-1-T28	1026576.700	1878748.100	685.2	1026576.683	1878748.026	685.648	-0.017	-0.074	0.448	
7	R7-1-T29	1026566.100	1878740.300	685.2	1026566.089	1878740.357	685.699	-0.011	0.057	0.499	
7	R7-1-T3	1026411.200	1878850.100	686.8	1026411.281	1878850.144	687.110	0.081	0.044	0.310	
7	R7-1-T4	1026421.000	1878849.100	687.0	1026420.963	1878849.018	687.392	-0.037	-0.082	0.392	
7	R7-1-T5	1026433.000	1878846.000	687.2	1026433.034	1878846.006	687.264	0.034	0.006	0.064	
7	R7-1-T6	1026447.900	1878840.000	GS	1026447.875	1878840.006	690.442	-0.025	0.006	NA	
7	R7-1-T7	1026420.100	1878839.200	687.0	1026420.127	1878839.275	687.367	0.027	0.075	0.367	
7	R7-1-T8	1026429.200	1878835.300	687.2	1026429.194	1878835.325	687.361	-0.006	0.025	0.161	
7	R7-1-T9	1026443.100	1878830.700	GS	1026443.083	1878830.669	688.887	-0.017	-0.031	NA	

Δ Elevation > 0.5 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS
 Bottom of Overburden
 Reach 7-2

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-2-9165t	1027219.200	1878465.400	688.6	1027219.237	1878465.455	689.261	0.037	0.055	0.661	All material was taken as targeted material
7	R7-2-T1	1027222.500	1878471.500	688.6	1027222.409	1878471.459	688.284	-0.091	-0.041	-0.316	Point was surveyed at existing ground surface
7	R7-2-T2	1027211.000	1878470.300	688.6	1027210.976	1878470.311	689.523	-0.024	0.011	0.923	All material was taken as targeted material
7	R7-2-T3	1027230.700	1878468.400	688.6	1027230.736	1878468.526	688.198	0.036	0.126	-0.402	Point was surveyed at existing ground surface
7	R7-2-T4	1027200.500	1878465.200	688.6	1027200.555	1878465.114	689.586	0.055	-0.086	0.986	All material was taken as targeted material
7	R7-2-T5	1027227.300	1878462.300	688.6	1027227.286	1878462.253	688.957	-0.014	-0.047	0.357	
7	R7-2-T6	1027221.200	1878461.800	688.6	1027221.232	1878461.877	689.263	0.032	0.077	0.663	All material was taken as targeted material
7	R7-2-T7	1027214.400	1878459.100	688.6	1027214.392	1878459.057	690.007	-0.008	-0.043	1.407	All material was taken as targeted material
7	R7-2-T8	1027218.400	1878457.800	688.6	1027218.378	1878457.838	689.781	-0.022	0.038	1.181	All material was taken as targeted material

Δ Elevation > 0.5 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-10000t	1027914.600	1877851.100	687.4	1027914.669	1877851.070	687.710	0.069	-0.030	0.310	
7	R7-3-10001t	1027970.500	1877888.500	686.4	1027970.449	1877888.549	686.809	-0.051	0.049	0.409	
7	R7-3-10002t	1027940.600	1877908.500	686.7	1027940.669	1877908.581	687.082	0.069	0.081	0.382	
7	R7-3-10005t	1027883.100	1877916.200	687.7	1027883.077	1877916.200	688.128	-0.023	0.000	0.428	
7	R7-3-10006t	1027895.000	1877923.500	687.4	1027895.057	1877923.519	687.718	0.057	0.019	0.318	
7	R7-3-10007t	1027950.300	1877957.200	685.7	1027950.280	1877957.202	686.034	-0.020	0.002	0.334	
7	R7-3-10009t	1027938.800	1877947.400	685.3	1027938.795	1877947.402	685.766	-0.005	0.002	0.466	
7	R7-3-10010t	1027921.900	1877944.600	686.3	1027921.845	1877944.626	686.682	-0.055	0.026	0.382	
7	R7-3-10011t	1027909.700	1877933.800	687.2	1027909.677	1877933.779	687.572	-0.023	-0.021	0.372	
7	R7-3-10012t	1027959.300	1877880.000	686.4	1027959.279	1877880.004	686.776	-0.021	0.004	0.376	
7	R7-3-10014t	1028018.000	1877836.500	685.4	1028018.006	1877836.535	685.823	0.006	0.035	0.423	
7	R7-3-10015t	1027942.000	1877875.300	687.1	1027942.003	1877875.313	687.393	0.003	0.013	0.293	
7	R7-3-10025t	1028002.400	1877831.700	685.8	1028002.490	1877831.684	686.148	0.090	-0.016	0.348	
7	R7-3-10028t	1027890.100	1877993.400	686.8	1027890.062	1877993.470	687.228	-0.038	0.070	0.428	
7	R7-3-10029t	1027664.400	1878209.300	688.4	1027664.398	1878209.375	688.874	-0.002	0.075	0.474	
7	R7-3-10031t	1027903.000	1877997.600	687.2	1027902.961	1877997.629	687.657	-0.039	0.029	0.457	
7	R7-3-10033t	1027861.000	1877978.500	688.8	1027861.016	1877978.432	689.254	0.016	-0.068	0.454	
7	R7-3-10035t	1027879.000	1877985.500	688.1	1027879.040	1877985.528	688.488	0.040	0.028	0.388	
7	R7-3-10036t	1027921.300	1878008.100	685.4	1027921.310	1878008.178	685.861	0.010	0.078	0.461	
7	R7-3-10042t	1027847.000	1878042.500	687.1	1027847.015	1878042.524	687.593	0.015	0.024	0.493	
7	R7-3-10045t	1027617.800	1878148.800	688.5	1027617.858	1878148.814	688.877	0.058	0.014	0.377	
7	R7-3-10046t	1027654.900	1878200.600	688.7	1027654.911	1878200.616	689.021	0.011	0.016	0.321	
7	R7-3-10047t	1027626.100	1878161.300	688.5	1027626.082	1878161.345	688.911	-0.018	0.045	0.411	
7	R7-3-10049t	1027635.600	1878175.600	688.6	1027635.556	1878175.578	689.066	-0.044	-0.022	0.466	
7	R7-3-10060t	1027647.700	1878186.200	688.7	1027647.729	1878186.149	689.137	0.029	-0.051	0.437	
7	R7-3-10062t	1027860.500	1878051.500	687.6	1027860.565	1878051.507	688.034	0.065	0.007	0.434	
7	R7-3-10063t	1027629.500	1878209.400	689.4	1027629.495	1878209.481	689.824	-0.005	0.081	0.424	
7	R7-3-10064t	1027632.300	1878219.600	688.3	1027632.264	1878219.522	688.608	-0.036	-0.078	0.308	
7	R7-3-10065t	1027640.200	1878233.900	689.3	1027640.234	1878233.877	689.634	0.034	-0.023	0.334	
7	R7-3-10066t	1027612.000	1878197.700	688.6	1027611.945	1878197.641	689.059	-0.055	-0.059	0.459	
7	R7-3-10067t	1027564.100	1878189.600	688.5	1027564.159	1878189.626	688.879	0.059	0.026	0.379	
7	R7-3-10068t	1027582.600	1878205.600	GS	1027582.556	1878205.636	689.752	-0.044	0.036	NA	
7	R7-3-10070t	1027874.400	1878058.100	687.1	1027874.454	1878058.133	687.424	0.054	0.033	0.324	
7	R7-3-10072t	1027572.300	1878197.300	687.8	1027572.267	1878197.281	688.269	-0.033	-0.019	0.469	
7	R7-3-10073t	1027890.500	1878071.900	685.3	1027890.510	1878071.859	686.220	0.010	-0.041	0.920	All material was taken as targeted material
7	R7-3-10074t	1027908.100	1878073.700	685.4	1027908.055	1878073.749	685.851	-0.045	0.049	0.451	
7	R7-3-10080t	1027599.800	1878181.700	687.9	1027599.711	1878181.772	688.365	-0.089	0.072	0.465	

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-10083t	1027599.400	1878225.800	688.8	1027599.474	1878225.815	689.249	0.074	0.015	0.449	
7	R7-3-10089t	1027577.700	1878156.200	689.0	1027577.684	1878156.225	689.254	-0.016	0.025	0.254	
7	R7-3-10091t	1027588.600	1878167.300	688.0	1027588.536	1878167.359	688.404	-0.064	0.059	0.404	
7	R7-3-10092t	1027461.300	1878276.700	GS	1027461.248	1878276.745	687.799	-0.052	0.045	NA	
7	R7-3-10094t	1027503.500	1878222.100	687.6	1027503.521	1878222.089	688.028	0.021	-0.011	0.428	
7	R7-3-10098t	1027515.500	1878235.500	687.8	1027515.529	1878235.507	688.915	0.029	0.007	1.115	All material was taken as targeted material
7	R7-3-10099t	1027526.400	1878250.200	688.1	1027526.436	1878250.176	689.214	0.036	-0.024	1.114	All material was taken as targeted material
7	R7-3-10100t	1027545.800	1878277.000	688.3	1027545.769	1878276.947	688.748	-0.031	-0.053	0.448	
7	R7-3-10111t	1027511.800	1878288.700	689.3	1027511.838	1878288.634	689.308	0.038	-0.066	0.008	
7	R7-3-10112t	1027495.200	1878210.700	689.3	1027495.154	1878210.680	689.355	-0.046	-0.020	0.055	
7	R7-3-10113t	1027503.200	1878275.800	688.6	1027503.154	1878275.791	689.785	-0.046	-0.009	1.185	All material was taken as targeted material
7	R7-3-10114t	1027498.700	1878259.600	688.7	1027498.717	1878259.591	688.767	0.017	-0.009	0.067	
7	R7-3-10115t	1027484.200	1878251.100	686.9	1027484.130	1878251.148	687.243	-0.070	0.048	0.343	
7	R7-3-10118t	1027548.100	1878218.500	688.6	1027548.102	1878218.481	688.944	0.002	-0.019	0.344	
7	R7-3-10121t	1027538.200	1878206.600	687.8	1027538.202	1878206.657	687.981	0.002	0.057	0.181	
7	R7-3-10122t	1027557.200	1878230.900	688.7	1027557.209	1878230.970	689.023	0.009	0.070	0.323	
7	R7-3-10123t	1027566.200	1878247.400	689.5	1027566.175	1878247.363	689.864	-0.025	-0.037	0.364	
7	R7-3-10124t	1027531.600	1878195.100	688.6	1027531.641	1878195.085	688.913	0.041	-0.015	0.313	
7	R7-3-10126t	1026765.600	1878806.700	688.9	1026765.602	1878806.756	688.877	0.002	0.056	-0.023	
7	R7-3-10130t	1026778.500	1878819.800	686.7	1026778.479	1878819.872	686.993	-0.021	0.072	0.293	
7	R7-3-10136t	1027434.700	1878296.000	687.2	1027434.765	1878295.966	687.568	0.065	-0.034	0.368	
7	R7-3-10138t	1026757.700	1878793.900	687.1	1026757.670	1878793.846	687.437	-0.030	-0.054	0.337	
7	R7-3-10142t	1027422.100	1878329.100	688.5	1027422.055	1878329.149	688.879	-0.045	0.049	0.379	
7	R7-3-10168t	1026784.000	1878829.800	687.2	1026783.953	1878829.822	687.538	-0.047	0.022	0.338	
7	R7-3-10170t	1026892.700	1878882.900	688.2	1026892.715	1878882.899	688.497	0.015	-0.001	0.297	
7	R7-3-10171t	1026881.500	1878867.600	688.4	1026881.503	1878867.632	688.686	0.003	0.032	0.286	
7	R7-3-10173t	1026850.500	1878882.400	688.6	1026850.516	1878882.440	688.881	0.016	0.040	0.281	
7	R7-3-10174t	1027536.500	1878262.500	688.9	1027536.495	1878262.526	689.373	-0.005	0.026	0.473	
7	R7-3-10175t	1026901.300	1878898.300	688.2	1026901.301	1878898.317	688.574	0.001	0.017	0.374	
7	R7-3-10176t	1026815.300	1878883.100	688.4	1026815.279	1878883.052	688.708	-0.021	-0.048	0.308	
7	R7-3-10177t	1026807.300	1878873.400	688.7	1026807.287	1878873.416	688.839	-0.013	0.016	0.139	
7	R7-3-10178t	1026792.300	1878843.900	688.5	1026792.332	1878843.932	688.856	0.032	0.032	0.356	
7	R7-3-10179t	1026846.000	1878869.200	689.0	1026846.053	1878869.218	689.389	0.053	0.018	0.389	
7	R7-3-10182t	1026798.400	1878860.200	689.4	1026798.410	1878860.258	689.647	0.010	0.058	0.247	
7	R7-3-10185t	1026918.600	1878871.600	688.5	1026918.658	1878871.625	688.654	0.058	0.025	0.154	
7	R7-3-10187t	1026968.500	1878879.000	688.1	1026968.524	1878879.024	688.276	0.024	0.024	0.176	
7	R7-3-10190t	1026932.500	1878899.100	687.7	1026932.475	1878899.067	688.047	-0.025	-0.033	0.347	

Δ Elevation > 0.5 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-10191t	1026922.900	1878882.100	687.7	1026922.913	1878882.087	687.935	0.013	-0.013	0.235	
7	R7-3-10200t	1026987.500	1878866.200	687.8	1026987.470	1878866.167	688.180	-0.030	-0.033	0.380	
7	R7-3-10201t	1027024.800	1878863.000	687.1	1027024.744	1878862.999	687.418	-0.056	-0.001	0.318	
7	R7-3-10202t	1027014.400	1878854.400	686.9	1027014.364	1878854.440	686.899	-0.036	0.040	-0.001	
7	R7-3-10210t	1026997.300	1878878.100	687.5	1026997.301	1878878.033	687.643	0.001	-0.067	0.143	
7	R7-3-10212t	1027040.600	1878830.200	688.3	1027040.579	1878830.183	688.588	-0.021	-0.017	0.288	
7	R7-3-10214t	1027116.200	1878811.600	687.4	1027116.180	1878811.625	687.653	-0.020	0.025	0.253	
7	R7-3-10222t	1027108.200	1878797.500	688.3	1027108.140	1878797.415	688.726	-0.060	-0.085	0.426	
7	R7-3-10223t	1027051.900	1878845.700	687.3	1027051.897	1878845.653	687.209	-0.003	-0.047	-0.091	
7	R7-3-10228t	1027086.200	1878828.600	687.0	1027086.255	1878828.668	687.043	0.055	0.068	0.043	
7	R7-3-10229t	1027074.900	1878817.400	687.9	1027074.843	1878817.446	688.347	-0.057	0.046	0.447	
7	R7-3-10230t	1027171.900	1878778.300	688.0	1027171.903	1878778.346	688.146	0.003	0.046	0.146	
7	R7-3-10231t	1027194.200	1878765.800	686.4	1027194.211	1878765.804	686.777	0.011	0.004	0.377	
7	R7-3-10232t	1027224.600	1878749.100	686.8	1027224.607	1878749.171	687.186	0.007	0.071	0.386	
7	R7-3-10233t	1027254.500	1878729.000	686.8	1027254.480	1878728.938	687.218	-0.020	-0.062	0.418	
7	R7-3-10235t	1027292.000	1878684.800	686.7	1027291.983	1878684.778	687.156	-0.017	-0.022	0.456	
7	R7-3-10237t	1027157.200	1878766.800	687.9	1027157.181	1878766.769	688.289	-0.019	-0.031	0.389	
7	R7-3-10238t	1027189.200	1878750.800	688.4	1027189.109	1878750.827	688.690	-0.091	0.027	0.290	
7	R7-3-10239t	1027220.800	1878735.300	688.2	1027220.728	1878735.358	688.501	-0.072	0.058	0.301	
7	R7-3-10240t	1027243.600	1878715.200	688.8	1027243.562	1878715.172	688.972	-0.038	-0.028	0.172	
7	R7-3-10241t	1027281.700	1878714.400	688.4	1027281.729	1878714.389	688.712	0.029	-0.011	0.312	
7	R7-3-10242t	1027301.100	1878700.300	686.9	1027301.043	1878700.316	687.332	-0.057	0.016	0.432	
7	R7-3-10244t	1027134.000	1878782.300	687.7	1027133.954	1878782.280	687.993	-0.046	-0.020	0.293	
7	R7-3-10245t	1027147.600	1878793.700	686.8	1027147.521	1878793.652	686.687	-0.079	-0.048	-0.113	
7	R7-3-10246t	1027346.500	1878640.200	687.5	1027346.535	1878640.211	687.880	0.035	0.011	0.380	
7	R7-3-10248t	1027355.200	1878654.500	687.1	1027355.199	1878654.552	687.331	-0.001	0.052	0.231	
7	R7-3-10462t	1026739.900	1878753.800	687.4	1026739.861	1878753.854	687.674	-0.039	0.054	0.274	
7	R7-3-10464t	1026735.700	1878747.800	687.1	1026735.657	1878747.780	687.505	-0.043	-0.020	0.405	
7	R7-3-10466t	1026732.600	1878740.900	687.6	1026732.579	1878740.888	687.804	-0.021	-0.012	0.204	
7	R7-3-10469t	1026747.100	1878768.700	686.7	1026747.097	1878768.686	687.080	-0.003	-0.014	0.380	
7	R7-3-10473t	1026716.200	1878776.200	686.2	1026716.161	1878776.214	686.627	-0.039	0.014	0.427	
7	R7-3-10475t	1026723.300	1878788.500	687.3	1026723.343	1878788.586	687.663	0.043	0.086	0.363	
7	R7-3-10477t	1026729.200	1878802.700	688.1	1026729.218	1878802.699	688.576	0.018	-0.001	0.476	
7	R7-3-10482t	1026736.600	1878819.100	688.5	1026736.546	1878819.088	688.687	-0.054	-0.012	0.187	
7	R7-3-10483t	1026744.000	1878830.400	688.5	1026744.044	1878830.497	688.846	0.044	0.097	0.346	
7	R7-3-10486t	1026749.200	1878841.800	688.4	1026749.165	1878841.825	688.782	-0.035	0.025	0.382	
7	R7-3-10489t	1026753.200	1878849.500	688.5	1026753.210	1878849.511	688.794	0.010	0.011	0.294	

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-10491t	1026761.100	1878861.300	688.4	1026761.137	1878861.327	688.697	0.037	0.027	0.297	
7	R7-3-10497t	1026767.100	1878876.100	687.9	1026767.134	1878876.053	688.124	0.034	-0.047	0.224	
7	R7-3-10498t	1026774.600	1878888.100	688.0	1026774.604	1878888.063	688.345	0.004	-0.037	0.345	
7	R7-3-10505t	1026707.300	1878760.100	687.0	1026707.301	1878760.065	687.180	0.001	-0.035	0.180	
7	R7-3-10507t	1026699.100	1878746.800	686.2	1026699.035	1878746.764	686.545	-0.065	-0.036	0.345	
7	R7-3-10511t	1026691.400	1878732.100	686.2	1026691.409	1878732.067	686.491	0.009	-0.033	0.291	
7	R7-3-10516t	1026663.100	1878749.500	685.5	1026663.043	1878749.447	685.820	-0.057	-0.053	0.320	
7	R7-3-10518t	1026671.600	1878762.900	686.6	1026671.612	1878762.846	687.028	0.012	-0.054	0.428	
7	R7-3-10520t	1026681.700	1878776.300	687.6	1026681.738	1878776.331	687.826	0.038	0.031	0.226	
7	R7-3-10523t	1026688.400	1878791.800	688.4	1026688.421	1878791.814	688.791	0.021	0.014	0.391	
7	R7-3-10524t	1026693.600	1878805.600	688.2	1026693.647	1878805.625	688.525	0.047	0.025	0.325	
7	R7-3-10527t	1026703.700	1878820.400	687.9	1026703.646	1878820.360	688.218	-0.054	-0.040	0.318	
7	R7-3-10528t	1026710.800	1878835.000	688.4	1026710.838	1878835.035	688.416	0.038	0.035	0.016	
7	R7-3-10530t	1026719.300	1878849.400	687.7	1026719.320	1878849.489	688.053	0.020	0.089	0.353	
7	R7-3-10537t	1026722.900	1878856.200	687.7	1026722.845	1878856.185	688.092	-0.055	-0.015	0.392	
7	R7-3-10539t	1026633.400	1878763.500	688.1	1026633.424	1878763.556	688.201	0.024	0.056	0.101	
7	R7-3-10542t	1026643.100	1878775.400	688.3	1026643.077	1878775.385	688.655	-0.023	-0.015	0.355	
7	R7-3-10543t	1026650.100	1878789.200	689.0	1026650.125	1878789.152	689.239	0.025	-0.048	0.239	
7	R7-3-10559t	1026624.400	1878750.100	685.8	1026624.401	1878750.034	686.165	0.001	-0.066	0.365	
7	R7-3-10565t	1026609.300	1878720.800	684.2	1026609.293	1878720.746	684.650	-0.007	-0.054	0.450	
7	R7-3-10567t	1026621.500	1878743.400	685.1	1026621.492	1878743.381	685.416	-0.008	-0.019	0.316	
7	R7-3-10571t	1026652.900	1878733.900	686.0	1026652.831	1878733.899	686.400	-0.069	-0.001	0.400	
7	R7-3-10573t	1026646.400	1878724.900	686.2	1026646.453	1878724.946	686.483	0.053	0.046	0.283	
7	R7-3-10576t	1026681.900	1878720.000	685.8	1026681.898	1878720.082	686.174	-0.002	0.082	0.374	
7	R7-3-10577t	1026674.400	1878701.800	685.3	1026674.500	1878701.797	685.740	0.100	-0.003	0.440	
7	R7-3-10579t	1026656.100	1878676.200	685.1	1026656.126	1878676.215	685.266	0.026	0.015	0.166	
7	R7-3-10582t	1026620.200	1878678.000	684.8	1026620.262	1878677.962	685.193	0.062	-0.038	0.393	
7	R7-3-10611t	1026836.100	1878856.700	687.5	1026836.068	1878856.658	687.708	-0.032	-0.042	0.208	
7	R7-3-10619t	1026825.700	1878841.600	686.9	1026825.697	1878841.530	687.198	-0.003	-0.070	0.298	
7	R7-3-10621t	1026817.300	1878825.400	686.9	1026817.272	1878825.389	687.292	-0.028	-0.011	0.392	
7	R7-3-10623t	1026808.900	1878813.500	687.5	1026808.877	1878813.539	687.867	-0.023	0.039	0.367	
7	R7-3-10626t	1026800.000	1878798.700	688.4	1026800.037	1878798.753	688.850	0.037	0.053	0.450	
7	R7-3-10628t	1026790.600	1878784.100	688.0	1026790.575	1878784.081	688.431	-0.025	-0.019	0.431	
7	R7-3-10640t	1026903.100	1878903.600	687.1	1026903.130	1878903.565	687.256	0.030	-0.035	0.156	
7	R7-3-10653t	1026970.400	1878884.300	687.1	1026970.374	1878884.307	687.337	-0.026	0.007	0.237	
7	R7-3-10656t	1026956.700	1878854.000	687.2	1026956.629	1878854.041	687.511	-0.071	0.041	0.311	
7	R7-3-10659t	1026955.700	1878845.200	689.8	1026955.623	1878845.160	689.993	-0.077	-0.040	0.193	

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-10673t	1026978.200	1878855.200	686.8	1026978.186	1878855.233	687.140	-0.014	0.033	0.340	
7	R7-3-10676t	1026968.700	1878841.400	689.2	1026968.721	1878841.398	689.624	0.021	-0.002	0.424	
7	R7-3-10677t	1027003.400	1878842.200	688.6	1027003.455	1878842.269	688.541	0.055	0.069	-0.059	
7	R7-3-10680t	1026992.700	1878830.400	687.9	1026992.685	1878830.422	687.704	-0.015	0.022	-0.196	
7	R7-3-10688t	1027027.900	1878818.900	688.6	1027027.961	1878818.868	688.743	0.061	-0.032	0.143	
7	R7-3-10691t	1027019.000	1878804.900	688.7	1027019.054	1878804.844	688.796	0.054	-0.056	0.096	
7	R7-3-10694t	1027013.200	1878798.300	689.8	1027013.143	1878798.263	690.014	-0.057	-0.037	0.214	
7	R7-3-10699t	1027061.400	1878800.300	689.2	1027061.396	1878800.287	689.657	-0.004	-0.013	0.457	
7	R7-3-10702t	1027050.800	1878788.700	688.4	1027050.752	1878788.710	688.675	-0.048	0.010	0.275	
7	R7-3-10707t	1027044.800	1878784.100	689.1	1027044.801	1878784.067	689.287	0.001	-0.033	0.187	
7	R7-3-10711t	1027100.800	1878780.700	689.3	1027100.817	1878780.784	689.305	0.017	0.084	0.005	
7	R7-3-10714t	1027094.500	1878766.700	689.7	1027094.469	1878766.656	689.959	-0.031	-0.044	0.259	
7	R7-3-10721t	1027149.500	1878800.000	686.5	1027149.531	1878800.026	686.618	0.031	0.026	0.118	
7	R7-3-10729t	1027181.400	1878784.100	687.0	1027181.475	1878784.072	687.352	0.075	-0.028	0.352	
7	R7-3-10735t	1027150.300	1878745.000	688.0	1027150.219	1878744.969	688.466	-0.081	-0.031	0.466	
7	R7-3-10741t	1027195.200	1878767.700	687.5	1027195.239	1878767.686	687.857	0.039	-0.014	0.357	
7	R7-3-10744t	1027200.700	1878773.700	687.3	1027200.660	1878773.727	687.636	-0.040	0.027	0.336	
7	R7-3-10746t	1027171.700	1878725.900	689.2	1027171.715	1878725.838	689.174	0.015	-0.062	-0.026	
7	R7-3-10750t	1027231.900	1878763.000	687.1	1027231.947	1878762.964	687.262	0.047	-0.036	0.162	
7	R7-3-10756t	1027207.300	1878708.800	688.6	1027207.318	1878708.828	688.498	0.018	0.028	-0.102	
7	R7-3-10760t	1027262.500	1878741.700	687.5	1027262.469	1878741.710	687.900	-0.031	0.010	0.400	
7	R7-3-10765t	1027235.200	1878697.900	688.5	1027235.153	1878697.953	688.778	-0.047	0.053	0.278	
7	R7-3-10767t	1027254.900	1878703.400	687.3	1027254.988	1878703.417	687.733	0.088	0.017	0.433	
7	R7-3-10771t	1027286.700	1878725.600	687.6	1027286.716	1878725.624	687.805	0.016	0.024	0.205	
7	R7-3-10774t	1027275.100	1878697.000	687.3	1027275.016	1878696.940	687.663	-0.084	-0.060	0.363	
7	R7-3-10787t	1027307.400	1878706.000	687.2	1027307.436	1878705.946	687.617	0.036	-0.054	0.417	
7	R7-3-10793t	1027314.800	1878686.200	686.9	1027314.826	1878686.209	687.251	0.026	0.009	0.351	
7	R7-3-10794t	1027307.300	1878668.200	687.7	1027307.344	1878668.232	688.051	0.044	0.032	0.351	
7	R7-3-10802t	1027318.900	1878692.200	687.1	1027318.830	1878692.263	687.325	-0.070	0.063	0.225	
7	R7-3-10804t	1027333.900	1878649.000	687.3	1027333.941	1878648.921	687.715	0.041	-0.079	0.415	
7	R7-3-10806t	1027273.600	1878709.000	687.0	1027273.546	1878708.957	687.457	-0.054	-0.043	0.457	
7	R7-3-10808t	1027265.600	1878693.700	688.1	1027265.521	1878693.653	688.194	-0.079	-0.047	0.094	
7	R7-3-10812t	1027342.600	1878661.300	686.4	1027342.558	1878661.274	686.528	-0.042	-0.026	0.128	
7	R7-3-10823t	1027358.200	1878599.600	688.6	1027358.171	1878599.620	688.909	-0.029	0.020	0.309	
7	R7-3-10828t	1027470.300	1878630.400	685.6	1027470.321	1878630.475	685.950	0.021	0.075	0.350	
7	R7-3-10830t	1027367.200	1878579.400	688.1	1027367.168	1878579.445	688.088	-0.032	0.045	-0.012	
7	R7-3-10857t	1027329.100	1878561.300	688.7	1027329.042	1878561.317	688.715	-0.058	0.017	0.015	

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-10859t	1027282.500	1878460.400	686.2	1027282.447	1878460.396	687.169	-0.053	-0.004	0.969	All material was taken as targeted material
7	R7-3-10861t	1027247.800	1878477.700	684.2	1027247.788	1878477.702	685.435	-0.012	0.002	1.235	All material was taken as targeted material
7	R7-3-10870t	1027223.700	1878541.100	688.3	1027223.660	1878541.145	688.801	-0.040	0.045	0.501	All material was taken as targeted material
7	R7-3-10873t	1027234.100	1878483.700	684.2	1027234.159	1878483.720	685.864	0.059	0.020	1.664	All material was taken as targeted material
7	R7-3-10912t	1026837.000	1878595.800	686.0	1026836.971	1878595.826	686.971	-0.029	0.026	0.971	All material was taken as targeted material
7	R7-3-10913t	1026870.400	1878587.800	685.3	1026870.356	1878587.744	685.831	-0.044	-0.056	0.531	All material was taken as targeted material
7	R7-3-10914t	1026932.300	1878558.400	684.3	1026932.227	1878558.330	686.182	-0.073	-0.070	1.882	All material was taken as targeted material
7	R7-3-10915t	1026982.700	1878525.400	687.3	1026982.600	1878525.356	687.358	-0.100	-0.044	0.058	
7	R7-3-10916t	1027018.500	1878505.300	687.1	1027018.516	1878505.241	687.330	0.016	-0.059	0.230	
7	R7-3-10918t	1027089.000	1878489.500	686.4	1027089.016	1878489.508	686.471	0.016	0.008	0.071	
7	R7-3-10919t	1027119.700	1878474.100	687.3	1027119.757	1878474.077	687.602	0.057	-0.023	0.302	
7	R7-3-10938t	1026600.300	1878707.300	683.5	1026600.300	1878707.436	684.012	0.000	0.136	0.512	All material was taken as targeted material
7	R7-3-10953t	1026615.600	1878755.600	684.9	1026615.590	1878755.566	685.029	-0.010	-0.034	0.129	
7	R7-3-10954t	1026603.700	1878741.700	683.9	1026603.689	1878741.771	684.071	-0.011	0.071	0.171	
7	R7-3-10955t	1026600.300	1878735.800	683.8	1026600.370	1878735.804	684.144	0.070	0.004	0.344	
7	R7-3-10973t	1026624.800	1878768.100	688.6	1026624.863	1878768.113	688.358	0.063	0.013	-0.242	
7	R7-3-10975t	1026668.700	1878790.200	687.4	1026668.637	1878790.207	687.731	-0.063	0.007	0.331	
7	R7-3-10976t	1026679.100	1878807.000	688.8	1026679.138	1878806.976	688.809	0.038	-0.024	0.009	
7	R7-3-10977t	1026684.100	1878818.300	688.2	1026684.130	1878818.303	688.381	0.030	0.003	0.181	
7	R7-3-10982t	1026843.600	1878838.000	688.5	1026843.663	1878838.046	688.855	0.063	0.046	0.355	
7	R7-3-10983t	1026851.100	1878852.300	688.1	1026851.192	1878852.332	688.470	0.092	0.032	0.370	
7	R7-3-10991t	1026739.300	1878721.200	687.8	1026739.278	1878721.206	688.037	-0.022	0.006	0.237	
7	R7-3-10993t	1026769.700	1878676.200	684.5	1026769.703	1878676.199	684.742	0.003	-0.001	0.242	
7	R7-3-10995t	1026868.200	1878638.800	686.3	1026868.244	1878638.791	686.304	0.044	-0.009	0.004	
7	R7-3-10996t	1026900.300	1878631.400	686.6	1026900.225	1878631.461	687.788	-0.075	0.061	1.188	All material was taken as targeted material
7	R7-3-11019t	1027118.900	1878544.500	685.2	1027118.868	1878544.444	686.102	-0.032	-0.056	0.902	All material was taken as targeted material
7	R7-3-11020t	1027145.600	1878526.300	685.2	1027145.622	1878526.367	686.199	0.022	0.067	0.999	All material was taken as targeted material
7	R7-3-11021t	1027338.400	1878438.200	687.5	1027338.354	1878438.221	687.758	-0.046	0.021	0.258	
7	R7-3-11022t	1027371.600	1878418.800	688.7	1027371.628	1878418.870	688.855	0.028	0.070	0.155	
7	R7-3-11037t	1027479.300	1878456.500	686.1	1027479.332	1878456.472	686.426	0.032	-0.028	0.326	
7	R7-3-11038t	1027470.000	1878445.300	686.6	1027470.026	1878445.342	686.994	0.026	0.042	0.394	
7	R7-3-11039t	1027458.300	1878429.700	687.6	1027458.290	1878429.705	688.050	-0.010	0.005	0.450	
7	R7-3-11040t	1027443.400	1878419.000	688.7	1027443.462	1878418.979	689.172	0.062	-0.021	0.472	
7	R7-3-11041t	1027432.300	1878403.600	687.9	1027432.312	1878403.631	688.236	0.012	0.031	0.336	
7	R7-3-11042t	1027496.700	1878456.100	685.3	1027496.672	1878456.044	685.624	-0.028	-0.056	0.324	
7	R7-3-11045t	1027550.600	1878491.300	685.0	1027550.556	1878491.235	685.406	-0.044	-0.065	0.406	
7	R7-3-11046t	1027540.500	1878478.400	684.0	1027540.451	1878478.425	684.020	-0.049	0.025	0.020	

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-11065t	1027563.700	1878533.300	684.9	1027563.745	1878533.320	685.113	0.045	0.020	0.213	
7	R7-3-11066t	1027550.200	1878566.400	686.8	1027550.136	1878566.362	687.017	-0.064	-0.038	0.217	
7	R7-3-11067t	1027585.800	1878509.800	685.2	1027585.747	1878509.848	685.232	-0.053	0.048	0.032	
7	R7-3-11068t	1027555.400	1878487.500	684.8	1027555.351	1878487.459	685.211	-0.049	-0.041	0.411	
7	R7-3-11069t	1027594.900	1878490.000	683.3	1027594.930	1878489.942	683.389	0.030	-0.058	0.089	
7	R7-3-11070t	1027566.600	1878468.000	684.0	1027566.633	1878467.994	685.372	0.033	-0.006	1.372	All material was taken as targeted material
7	R7-3-11089t	1027393.200	1878400.700	689.2	1027393.171	1878400.636	689.465	-0.029	-0.064	0.265	
7	R7-3-11090t	1027410.500	1878391.000	688.5	1027410.499	1878391.001	688.802	-0.001	0.001	0.302	
7	R7-3-11091t	1027420.800	1878374.800	688.4	1027420.873	1878374.735	688.779	0.073	-0.065	0.379	
7	R7-3-11092t	1027411.200	1878362.000	688.7	1027411.180	1878361.986	689.127	-0.020	-0.014	0.427	
7	R7-3-11095t	1027422.000	1878340.000	689.0	1027421.955	1878339.957	689.197	-0.045	-0.043	0.197	
7	R7-3-11109t	1027494.900	1878286.800	688.9	1027494.878	1878286.870	689.351	-0.022	0.070	0.451	
7	R7-3-11111t	1027491.900	1878280.200	688.5	1027491.900	1878280.214	688.686	0.000	0.014	0.186	
7	R7-3-11112t	1027476.900	1878241.900	687.4	1027476.939	1878241.884	687.615	0.039	-0.016	0.215	
7	R7-3-11114t	1027532.600	1878598.700	686.9	1027532.686	1878598.724	687.327	0.086	0.024	0.427	
7	R7-3-11128t	1027386.200	1878631.400	686.9	1027386.146	1878631.393	687.162	-0.054	-0.007	0.262	
7	R7-3-11130t	1027485.000	1878223.900	687.6	1027484.957	1878223.897	688.047	-0.043	-0.003	0.447	
7	R7-3-11133t	1027576.300	1878261.200	689.0	1027576.362	1878261.172	689.492	0.062	-0.028	0.492	
7	R7-3-11134t	1027542.500	1878186.700	688.5	1027542.490	1878186.697	688.955	-0.010	-0.003	0.455	
7	R7-3-11137t	1027556.800	1878181.300	688.5	1027556.845	1878181.284	688.895	0.045	-0.016	0.395	
7	R7-3-11155t	1027559.100	1878165.500	688.4	1027559.147	1878165.460	688.618	0.047	-0.040	0.218	
7	R7-3-11159t	1027696.000	1878209.400	689.0	1027695.962	1878209.453	688.846	-0.038	0.053	-0.154	
7	R7-3-11160t	1027635.100	1878146.200	688.0	1027635.133	1878146.210	688.431	0.033	0.010	0.431	
7	R7-3-11163t	1027654.500	1878146.800	687.8	1027654.400	1878146.825	688.216	-0.100	0.025	0.416	
7	R7-3-11164t	1027730.700	1878217.000	689.1	1027730.683	1878217.055	689.431	-0.017	0.055	0.331	
7	R7-3-11167t	1027752.600	1878311.300	686.7	1027752.667	1878311.339	686.526	0.067	0.039	-0.174	
7	R7-3-11169t	1027742.900	1878244.800	686.9	1027742.890	1878244.886	686.919	-0.010	0.086	0.019	
7	R7-3-11196t	1027602.600	1878488.600	683.9	1027602.622	1878488.677	684.377	0.022	0.077	0.477	
7	R7-3-11197t	1027614.500	1878502.700	684.1	1027614.586	1878502.664	684.202	0.086	-0.036	0.102	
7	R7-3-11213t	1027633.600	1878460.300	684.1	1027633.520	1878460.303	684.573	-0.080	0.003	0.473	
7	R7-3-11214t	1027653.900	1878488.700	683.6	1027653.983	1878488.662	685.319	0.083	-0.038	1.719	All material was taken as targeted material
7	R7-3-11217t	1027673.900	1878480.800	683.8	1027673.970	1878480.842	685.351	0.070	0.042	1.551	All material was taken as targeted material
7	R7-3-11218t	1027669.300	1878451.500	683.6	1027669.347	1878451.530	685.064	0.047	0.030	1.464	All material was taken as targeted material
7	R7-3-11219t	1027696.900	1878456.900	683.2	1027696.909	1878456.823	684.196	0.009	-0.077	0.996	All material was taken as targeted material
7	R7-3-11220t	1027726.900	1878433.100	682.5	1027726.900	1878433.163	684.058	0.000	0.063	1.558	All material was taken as targeted material
7	R7-3-11221t	1027714.600	1878420.400	683.1	1027714.638	1878420.312	685.087	0.038	-0.088	1.987	All material was taken as targeted material
7	R7-3-11222t	1027722.200	1878405.800	685.1	1027722.193	1878405.806	685.964	-0.007	0.006	0.864	All material was taken as targeted material

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-11223t	1027735.600	1878390.800	684.5	1027735.531	1878390.723	686.122	-0.069	-0.077	1.622	All material was taken as targeted material
7	R7-3-11224t	1027760.700	1878267.000	687.9	1027760.752	1878266.993	687.895	0.052	-0.007	-0.005	
7	R7-3-11243t	1027695.000	1878436.000	684.0	1027694.994	1878435.974	685.045	-0.006	-0.026	1.045	All material was taken as targeted material
7	R7-3-11245t	1027742.800	1878386.200	684.8	1027742.793	1878386.217	685.866	-0.007	0.017	1.066	All material was taken as targeted material
7	R7-3-11247t	1027768.400	1878221.400	688.0	1027768.406	1878221.352	688.396	0.006	-0.048	0.396	
7	R7-3-11248t	1027757.800	1878227.600	687.8	1027757.713	1878227.527	688.237	-0.087	-0.073	0.437	
7	R7-3-11249t	1027688.500	1878135.900	687.7	1027688.427	1878135.889	687.900	-0.073	-0.011	0.200	
7	R7-3-11250t	1027772.100	1878210.400	689.2	1027772.040	1878210.436	689.209	-0.060	0.036	0.009	
7	R7-3-11251t	1027727.700	1878128.700	688.2	1027727.772	1878128.764	688.443	0.072	0.064	0.243	
7	R7-3-11252t	1027766.500	1878113.600	687.4	1027766.453	1878113.522	687.758	-0.047	-0.078	0.358	
7	R7-3-11254t	1027821.000	1878284.800	683.0	1027821.033	1878284.835	684.174	0.033	0.035	1.174	All material was taken as targeted material
7	R7-3-11257t	1027835.600	1878247.700	684.0	1027835.587	1878247.762	684.979	-0.013	0.062	0.979	All material was taken as targeted material
7	R7-3-11258t	1027843.100	1878236.000	684.4	1027843.057	1878235.937	685.324	-0.043	-0.063	0.924	All material was taken as targeted material
7	R7-3-11259t	1027856.600	1878225.400	683.6	1027856.520	1878225.469	684.995	-0.080	0.069	1.395	All material was taken as targeted material
7	R7-3-11275t	1027746.300	1878320.200	687.3	1027746.359	1878320.164	687.680	0.059	-0.036	0.380	
7	R7-3-11276t	1027749.400	1878218.200	688.5	1027749.329	1878218.244	688.948	-0.071	0.044	0.448	
7	R7-3-11301t	1027750.800	1878375.800	684.4	1027750.895	1878375.776	684.746	0.095	-0.024	0.346	
7	R7-3-11302t	1027875.100	1878205.100	684.7	1027875.112	1878205.054	684.957	0.012	-0.046	0.257	
7	R7-3-11304t	1027883.800	1878175.000	684.5	1027883.803	1878174.952	684.813	0.003	-0.048	0.313	
7	R7-3-11308t	1027852.300	1877973.700	688.7	1027852.342	1877973.659	689.116	0.042	-0.041	0.416	
7	R7-3-11309t	1027874.600	1877934.000	687.8	1027874.608	1877933.959	688.237	0.008	-0.041	0.437	
7	R7-3-11325t	1027970.500	1877771.000	685.8	1027970.563	1877770.952	686.136	0.063	-0.048	0.336	
7	R7-3-11339t	1027988.500	1877729.700	686.0	1027988.486	1877729.674	686.246	-0.014	-0.026	0.246	
7	R7-3-11340t	1027978.400	1877726.900	686.9	1027978.432	1877726.885	687.132	0.032	-0.015	0.232	
7	R7-3-11367t	1028025.900	1877809.300	684.9	1028025.933	1877809.310	685.281	0.033	0.010	0.381	
7	R7-3-11368t	1028024.300	1877788.000	683.8	1028024.261	1877788.052	684.227	-0.039	0.052	0.427	
7	R7-3-11369t	1027966.100	1877744.100	687.1	1027966.050	1877744.130	687.445	-0.050	0.030	0.345	
7	R7-3-11388t	1027908.700	1878105.700	685.5	1027908.663	1878105.755	685.975	-0.037	0.055	0.475	
7	R7-3-11389t	1027914.300	1878049.000	685.6	1027914.277	1878049.039	685.949	-0.023	0.039	0.349	
7	R7-3-11390t	1027930.500	1878015.300	685.0	1027930.453	1878015.270	685.325	-0.047	-0.030	0.325	
7	R7-3-11393t	1027873.500	1877915.400	686.9	1027873.455	1877915.411	687.110	-0.045	0.011	0.210	
7	R7-3-11395t	1027995.600	1877897.800	685.0	1027995.628	1877897.739	685.372	0.028	-0.061	0.372	
7	R7-3-11398t	1027759.600	1878296.600	686.8	1027759.632	1878296.526	687.213	0.032	-0.074	0.413	
7	R7-3-11400t	1027939.000	1878002.600	685.1	1027938.923	1878002.667	685.259	-0.077	0.067	0.159	
7	R7-3-11403t	1027586.000	1878468.900	684.9	1027585.941	1878468.943	685.087	-0.059	0.043	0.187	
7	R7-3-11408t	1027722.300	1878340.500	687.1	1027722.245	1878340.551	687.416	-0.055	0.051	0.316	
7	R7-3-11446t	1027610.000	1878464.300	684.8	1027609.965	1878464.233	685.064	-0.035	-0.067	0.264	

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-11447t	1027600.100	1878452.600	685.4	1027600.066	1878452.645	685.634	-0.034	0.045	0.234	
7	R7-3-11466t	1027756.700	1878216.300	688.7	1027756.687	1878216.368	688.999	-0.013	0.068	0.299	
7	R7-3-11483t	1027897.000	1878164.000	684.2	1027897.077	1878163.988	684.463	0.077	-0.012	0.263	
7	R7-3-11499t	1026596.000	1878773.100	687.6	1026596.059	1878773.069	688.003	0.059	-0.031	0.403	
7	R7-3-11500t	1026750.400	1878699.100	685.9	1026750.400	1878699.142	686.355	0.000	0.042	0.455	
7	R7-3-11501t	1026591.800	1878768.800	687.1	1026591.800	1878768.772	687.479	0.000	-0.028	0.379	
7	R7-3-11519t	1027121.800	1878757.000	687.7	1027121.730	1878756.944	687.739	-0.070	-0.056	0.039	
7	R7-3-11520t	1027126.200	1878764.300	687.2	1027126.231	1878764.335	687.642	0.031	0.035	0.442	
7	R7-3-11521t	1027182.100	1878740.200	687.5	1027182.106	1878740.242	687.556	0.006	0.042	0.056	
7	R7-3-11522t	1027213.100	1878723.200	687.6	1027213.166	1878723.180	687.729	0.066	-0.020	0.129	
7	R7-3-11597t	1027477.000	1878266.300	687.7	1027477.062	1878266.328	687.839	0.062	0.028	0.139	
7	R7-3-11598t	1027469.800	1878260.400	687.4	1027469.758	1878260.428	687.383	-0.042	0.028	-0.017	
7	R7-3-11601t	1027549.400	1878284.900	687.7	1027549.388	1878284.870	687.921	-0.012	-0.030	0.221	
7	R7-3-11626t	1027402.400	1878382.500	689.1	1027402.342	1878382.457	689.430	-0.058	-0.043	0.330	
7	R7-3-11627t	1027428.400	1878388.300	688.2	1027428.356	1878388.213	688.529	-0.044	-0.087	0.329	
7	R7-3-11645t	1027687.200	1878345.700	691.9	1027687.214	1878345.760	691.606	0.014	0.060	-0.294	Point was surveyed at existing ground surface
7	R7-3-11662t	1027681.200	1878338.800	691.4	1027681.143	1878338.820	691.784	-0.057	0.020	0.384	
7	R7-3-11664t	1027697.100	1878333.500	688.6	1027697.105	1878333.431	688.543	0.005	-0.069	-0.057	
7	R7-3-11667t	1027707.900	1878322.500	687.9	1027707.978	1878322.553	688.347	0.078	0.053	0.447	
7	R7-3-11668t	1027698.000	1878309.600	688.3	1027698.038	1878309.604	688.674	0.038	0.004	0.374	
7	R7-3-11669t	1027686.000	1878322.200	688.4	1027685.982	1878322.280	688.289	-0.018	0.080	-0.111	
7	R7-3-11670t	1027685.900	1878297.000	692.2	1027685.994	1878296.979	692.453	0.094	-0.021	0.253	
7	R7-3-11674t	1027714.900	1878304.800	687.5	1027714.852	1878304.754	687.603	-0.048	-0.046	0.103	
7	R7-3-11675t	1027709.200	1878298.200	687.9	1027709.266	1878298.115	688.031	0.066	-0.085	0.131	
7	R7-3-11689t	1027704.300	1878292.100	688.0	1027704.317	1878292.142	688.081	0.017	0.042	0.081	
7	R7-3-11692t	1027714.700	1878280.500	689.1	1027714.783	1878280.507	689.400	0.083	0.007	0.300	
7	R7-3-11699t	1027675.700	1878356.100	689.6	1027675.736	1878356.018	691.964	0.036	-0.082	2.364	All material was taken as targeted material
7	R7-3-11700t	1027711.800	1878274.500	689.0	1027711.750	1878274.543	689.444	-0.050	0.043	0.444	
7	R7-3-11721t	1027536.300	1878183.500	688.5	1027536.332	1878183.524	688.921	0.032	0.024	0.421	
7	R7-3-11726t	1027760.700	1878289.100	688.5	1027760.738	1878289.095	688.889	0.038	-0.005	0.389	
7	R7-3-11758t	1027742.100	1878326.500	688.2	1027742.091	1878326.434	688.424	-0.009	-0.066	0.224	
7	R7-3-11807t	1026598.400	1878755.500	685.2	1026598.420	1878755.458	685.629	0.020	-0.042	0.429	
7	R7-3-11808t	1026608.700	1878776.000	688.0	1026608.714	1878775.963	688.369	0.014	-0.037	0.369	
7	R7-3-14783t	1027963.900	1877719.800	686.9	1027963.871	1877719.827	687.304	-0.029	0.027	0.404	
7	R7-3-15096t	1026761.800	1878898.000	688.0	1026761.756	1878897.985	688.159	-0.044	-0.015	0.159	
7	R7-3-15127t	1026717.600	1878713.900	686.9	1026717.650	1878713.909	687.376	0.050	0.009	0.476	
7	R7-3-15175t	1027383.600	1878583.200	688.1	1027383.590	1878583.160	688.569	-0.010	-0.040	0.469	

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-16003t	1027687.800	1878463.900	685.0	1027687.824	1878463.855	684.374	0.024	-0.045	-0.626	
7	R7-3-16008t	1026861.900	1878645.500	687.2	1026862.006	1878645.584	686.985	0.106	0.084	-0.215	
7	R7-3-8924t	1026679.900	1878658.200	686.4	1026680.005	1878658.148	686.696	0.105	-0.052	0.296	
7	R7-3-8925t	1026691.400	1878670.700	685.5	1026691.293	1878670.689	685.984	-0.107	-0.011	0.484	
7	R7-3-8926t	1026709.200	1878699.500	686.7	1026709.210	1878699.547	686.629	0.010	0.047	-0.071	
7	R7-3-8928t	1026728.200	1878725.900	687.4	1026728.153	1878725.897	687.881	-0.047	-0.003	0.481	
7	R7-3-8931t	1026700.700	1878685.800	686.3	1026700.686	1878685.759	685.984	-0.014	-0.041	-0.316	Point was surveyed at existing ground surface
7	R7-3-8935t	1026747.200	1878691.800	GS	1026747.225	1878691.806	687.474	0.025	0.006	NA	
7	R7-3-8940t	1026716.400	1878649.900	GS	1026716.372	1878649.830	686.630	-0.028	-0.070	NA	
7	R7-3-8941t	1026645.100	1878714.100	685.5	1026645.149	1878714.092	685.774	0.049	-0.008	0.274	
7	R7-3-8943t	1026725.100	1878664.200	685.3	1026725.055	1878664.174	685.535	-0.045	-0.026	0.235	
7	R7-3-8948t	1026765.800	1878667.700	685.5	1026765.827	1878667.654	685.932	0.027	-0.046	0.432	
7	R7-3-8949t	1026734.300	1878678.300	686.4	1026734.298	1878678.405	686.848	-0.002	0.105	0.448	
7	R7-3-8959t	1026661.800	1878686.200	GS	1026661.812	1878686.170	685.225	0.012	-0.030	NA	
7	R7-3-8965t	1026606.600	1878717.800	684.9	1026606.580	1878717.834	685.350	-0.020	0.034	0.450	
7	R7-3-8966t	1026628.500	1878689.000	GS	1026628.478	1878689.040	684.659	-0.022	0.040	NA	
7	R7-3-8968t	1026636.700	1878699.300	GS	1026636.729	1878699.358	685.242	0.029	0.058	NA	
7	R7-3-8969t	1026601.600	1878708.800	683.9	1026601.581	1878708.798	683.908	-0.019	-0.002	0.008	
7	R7-3-8971t	1026672.300	1878699.700	685.9	1026672.340	1878699.731	685.712	0.040	0.031	-0.188	
7	R7-3-8979t	1026815.600	1878615.900	685.8	1026815.559	1878615.913	686.497	-0.041	0.013	0.697	All material was taken as targeted material
7	R7-3-8982t	1026895.700	1878626.700	686.0	1026895.752	1878626.571	686.307	0.052	-0.129	0.307	
7	R7-3-8983t	1026883.800	1878610.500	GS	1026883.694	1878610.410	685.327	-0.106	-0.090	NA	
7	R7-3-8986t	1026850.400	1878614.900	GS	1026850.302	1878614.972	685.756	-0.098	0.072	NA	
7	R7-3-8991t	1026930.500	1878624.400	687.6	1026930.539	1878624.492	689.351	0.039	0.092	1.751	All material was taken as targeted material
7	R7-3-8992t	1026826.200	1878630.700	GS	1026826.137	1878630.733	685.672	-0.063	0.033	NA	
7	R7-3-8993t	1026803.900	1878605.100	686.5	1026803.879	1878605.016	687.649	-0.021	-0.084	1.149	All material was taken as targeted material
7	R7-3-8995t	1026832.700	1878644.200	684.5	1026832.782	1878644.310	685.120	0.082	0.110	0.620	All material was taken as targeted material
7	R7-3-8996t	1026786.400	1878637.200	686.1	1026786.440	1878637.128	686.668	0.040	-0.072	0.568	All material was taken as targeted material
7	R7-3-8997t	1026791.300	1878646.900	684.7	1026791.278	1878646.935	686.366	-0.022	0.035	1.666	All material was taken as targeted material
7	R7-3-8998t	1026776.500	1878622.000	686.9	1026776.449	1878622.047	686.982	-0.051	0.047	0.082	
7	R7-3-9000t	1026748.700	1878634.300	686.4	1026748.536	1878634.143	686.757	-0.164	-0.157	0.357	
7	R7-3-9001t	1026755.200	1878645.900	685.1	1026755.220	1878645.938	685.563	0.020	0.038	0.463	
7	R7-3-9002t	1026855.400	1878628.400	GS	1026855.495	1878628.499	685.018	0.095	0.099	NA	
7	R7-3-9011t	1026840.600	1878601.400	GS	1026840.683	1878601.377	686.010	0.083	-0.023	NA	
7	R7-3-9013t	1026885.200	1878592.800	GS	1026885.198	1878592.820	685.609	-0.002	0.020	NA	
7	R7-3-9023t	1026896.800	1878570.500	GS	1026896.852	1878570.542	686.593	0.052	0.042	NA	
7	R7-3-9024t	1026909.200	1878582.900	GS	1026909.156	1878582.874	685.508	-0.044	-0.026	NA	

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-9026t	1026798.500	1878664.400	GS	1026798.558	1878664.346	685.635	0.058	-0.054	NA	
7	R7-3-9035t	1027012.600	1878564.400	GS	1027012.592	1878564.356	685.124	-0.008	-0.044	NA	
7	R7-3-9041t	1026917.400	1878597.700	GS	1026917.367	1878597.642	685.624	-0.033	-0.058	NA	
7	R7-3-9043t	1026957.100	1878602.400	GS	1026957.085	1878602.351	686.339	-0.015	-0.049	NA	
7	R7-3-9044t	1026946.600	1878587.000	GS	1026946.626	1878587.045	685.771	0.026	0.045	NA	
7	R7-3-9047t	1027003.500	1878547.200	685.4	1027003.513	1878547.265	685.077	0.013	0.065	-0.323	Point was surveyed at existing ground surface
7	R7-3-9048t	1026989.900	1878591.700	685.8	1026990.007	1878591.714	686.276	0.107	0.014	0.476	
7	R7-3-9049t	1027018.800	1878517.200	687.4	1027018.741	1878517.155	687.472	-0.059	-0.045	0.072	
7	R7-3-9050t	1027019.500	1878579.800	687.0	1027019.583	1878579.862	686.169	0.083	0.062	-0.831	Point was surveyed at existing ground surface
7	R7-3-9052t	1026992.100	1878532.300	685.5	1026992.040	1878532.228	685.976	-0.060	-0.072	0.476	
7	R7-3-9054t	1027045.300	1878568.500	686.1	1027045.251	1878568.495	686.120	-0.049	-0.005	0.020	
7	R7-3-9057t	1026937.000	1878569.700	685.5	1026936.915	1878569.738	685.981	-0.085	0.038	0.481	
7	R7-3-9059t	1027224.400	1878533.000	686.4	1027224.317	1878532.922	687.322	-0.083	-0.078	0.922	All material was taken as targeted material
7	R7-3-9094t	1027137.700	1878522.900	GS	1027137.744	1878522.876	686.098	0.044	-0.024	NA	
7	R7-3-9095t	1027107.800	1878522.600	685.3	1027107.771	1878522.548	685.960	-0.029	-0.052	0.660	
7	R7-3-9097t	1027095.400	1878507.400	GS	1027095.429	1878507.306	685.650	0.029	-0.094	NA	
7	R7-3-9101t	1027119.500	1878481.200	687.6	1027119.567	1878481.203	687.928	0.067	0.003	0.328	
7	R7-3-9102t	1027168.700	1878508.700	685.0	1027168.714	1878508.788	686.194	0.014	0.088	1.194	All material was taken as targeted material
7	R7-3-9104t	1027134.800	1878511.300	GS	1027134.782	1878511.330	686.090	-0.018	0.030	NA	
7	R7-3-9105t	1027182.400	1878532.900	686.2	1027182.414	1878532.910	687.116	0.014	0.010	0.916	All material was taken as targeted material
7	R7-3-9107t	1027161.600	1878494.400	GS	1027161.646	1878494.396	686.114	0.046	-0.004	NA	
7	R7-3-9108t	1027150.800	1878477.000	687.1	1027150.830	1878476.964	688.019	0.030	-0.036	0.919	All material was taken as targeted material
7	R7-3-9109t	1027123.200	1878497.700	GS	1027123.186	1878497.740	685.751	-0.014	0.040	NA	
7	R7-3-9110t	1027084.000	1878555.000	685.7	1027083.969	1878554.918	686.045	-0.031	-0.082	0.345	
7	R7-3-9111t	1026981.500	1878574.700	685.4	1026981.448	1878574.693	685.288	-0.052	-0.007	-0.112	
7	R7-3-9112t	1026970.300	1878565.300	GS	1026970.236	1878565.348	685.472	-0.064	0.048	NA	
7	R7-3-9113t	1026959.300	1878540.500	686.8	1026959.256	1878540.539	687.524	-0.044	0.039	0.724	All material was taken as targeted material
7	R7-3-9114t	1026963.400	1878552.800	GS	1026963.347	1878552.836	685.928	-0.053	0.036	NA	
7	R7-3-9115t	1027040.300	1878551.200	GS	1027040.361	1878551.141	685.256	0.061	-0.059	NA	
7	R7-3-9116t	1027029.000	1878532.600	GS	1027029.004	1878532.616	685.532	0.004	0.016	NA	
7	R7-3-9118t	1027074.000	1878542.100	GS	1027074.070	1878542.126	685.353	0.070	0.026	NA	
7	R7-3-9119t	1027089.800	1878496.800	686.2	1027089.824	1878496.731	686.426	0.024	-0.069	0.226	
7	R7-3-9120t	1027048.900	1878499.600	688.3	1027048.877	1878499.578	688.614	-0.023	-0.022	0.314	
7	R7-3-9122t	1027066.500	1878526.500	GS	1027066.502	1878526.399	685.290	0.002	-0.101	NA	
7	R7-3-9124t	1027116.500	1878532.300	685.8	1027116.526	1878532.314	686.059	0.026	0.014	0.259	
7	R7-3-9127t	1027056.800	1878516.700	685.8	1027056.780	1878516.630	685.846	-0.020	-0.070	0.046	
7	R7-3-9128t	1027174.300	1878515.900	685.7	1027174.276	1878515.856	686.533	-0.024	-0.044	0.833	All material was taken as targeted material

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-9131t	1027376.900	1878568.300	688.5	1027376.928	1878568.293	688.712	0.028	-0.007	0.212	
7	R7-3-9133t	1027193.000	1878491.900	GS	1027193.030	1878491.829	685.959	0.030	-0.071	NA	
7	R7-3-9137t	1027215.500	1878519.600	685.6	1027215.498	1878519.628	686.631	-0.002	0.028	1.031	All material was taken as targeted material
7	R7-3-9139t	1027278.800	1878563.200	688.9	1027278.806	1878563.187	690.223	0.006	-0.013	1.323	All material was taken as targeted material
7	R7-3-9140t	1027257.300	1878533.200	687.9	1027257.249	1878533.165	688.028	-0.051	-0.035	0.128	
7	R7-3-9141t	1027263.600	1878545.500	688.2	1027263.647	1878545.454	689.469	0.047	-0.046	1.269	All material was taken as targeted material
7	R7-3-9142t	1027236.300	1878494.300	GS	1027236.324	1878494.302	686.432	0.024	0.002	NA	
7	R7-3-9153t	1026926.800	1878609.900	GS	1026926.712	1878609.940	686.201	-0.088	0.040	NA	
7	R7-3-9160t	1027205.900	1878507.700	GS	1027205.901	1878507.681	686.430	0.001	-0.019	NA	
7	R7-3-9168t	1027397.200	1878594.600	688.0	1027397.219	1878594.577	688.163	0.019	-0.023	0.163	
7	R7-3-9169t	1027284.200	1878519.300	686.5	1027284.266	1878519.271	687.538	0.066	-0.029	1.038	All material was taken as targeted material
7	R7-3-9170t	1027409.200	1878606.500	688.3	1027409.172	1878606.492	688.583	-0.028	-0.008	0.283	
7	R7-3-9171t	1027254.400	1878482.200	GS	1027254.376	1878482.088	685.833	-0.024	-0.112	NA	
7	R7-3-9172t	1027421.500	1878619.400	687.5	1027421.529	1878619.377	687.591	0.029	-0.023	0.091	
7	R7-3-9178t	1027428.500	1878632.100	687.5	1027428.449	1878632.074	687.872	-0.051	-0.026	0.372	
7	R7-3-9181t	1027248.800	1878520.600	686.3	1027248.801	1878520.627	686.647	0.001	0.027	0.347	
7	R7-3-9182t	1027240.500	1878506.200	685.7	1027240.502	1878506.194	686.616	0.002	-0.006	0.916	All material was taken as targeted material
7	R7-3-9183t	1027340.800	1878576.500	688.0	1027340.768	1878576.526	688.069	-0.032	0.026	0.069	
7	R7-3-9192t	1027316.100	1878548.100	GS	1027316.095	1878548.083	689.399	-0.005	-0.017	NA	
7	R7-3-9193t	1027295.700	1878528.700	687.9	1027295.770	1878528.722	688.811	0.070	0.022	0.911	All material was taken as targeted material
7	R7-3-9194t	1027274.500	1878507.200	686.7	1027274.477	1878507.155	686.662	-0.023	-0.045	-0.038	
7	R7-3-9195t	1027261.800	1878496.400	GS	1027261.829	1878496.337	686.520	0.029	-0.063	NA	
7	R7-3-9196t	1027307.300	1878540.700	688.1	1027307.259	1878540.752	689.207	-0.041	0.052	1.107	All material was taken as targeted material
7	R7-3-9241t	1027322.500	1878462.600	686.4	1027322.497	1878462.597	686.565	-0.003	-0.003	0.165	
7	R7-3-9245t	1027369.900	1878614.500	688.2	1027369.946	1878614.487	688.387	0.046	-0.013	0.187	
7	R7-3-9248t	1027393.700	1878547.300	687.6	1027393.603	1878547.270	689.838	-0.097	-0.030	2.238	All material was taken as targeted material
7	R7-3-9249t	1027354.900	1878495.800	686.4	1027354.890	1878495.805	686.770	-0.010	0.005	0.370	
7	R7-3-9250t	1027345.800	1878485.000	685.6	1027345.854	1878484.972	685.978	0.054	-0.028	0.378	
7	R7-3-9251t	1027377.700	1878631.400	687.0	1027377.673	1878631.417	687.160	-0.027	0.017	0.160	
7	R7-3-9254t	1027440.700	1878600.100	686.2	1027440.751	1878600.120	689.297	0.051	0.020	3.097	All material was taken as targeted material
7	R7-3-9255t	1027334.400	1878472.200	686.0	1027334.485	1878472.248	686.123	0.085	0.048	0.123	
7	R7-3-9258t	1027313.100	1878451.400	687.7	1027313.098	1878451.411	687.553	-0.002	0.011	-0.147	
7	R7-3-9259t	1027377.800	1878526.100	687.5	1027377.736	1878526.223	687.898	-0.064	0.123	0.398	
7	R7-3-9260t	1027366.900	1878512.800	GS	1027366.981	1878512.823	687.800	0.081	0.023	NA	
7	R7-3-9261t	1027484.600	1878594.600	687.8	1027484.506	1878594.587	688.243	-0.094	-0.013	0.443	
7	R7-3-9262t	1027365.600	1878554.100	688.4	1027365.696	1878554.173	688.810	0.096	0.073	0.410	
7	R7-3-9263t	1027286.300	1878471.900	684.8	1027286.291	1878471.974	685.778	-0.009	0.074	0.978	All material was taken as targeted material

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-9264t	1027298.600	1878476.200	685.7	1027298.570	1878476.210	686.085	-0.030	0.010	0.385	
7	R7-3-9265t	1027312.600	1878491.700	686.3	1027312.620	1878491.616	686.624	0.020	-0.084	0.324	
7	R7-3-9266t	1027324.800	1878506.300	GS	1027324.814	1878506.330	687.122	0.014	0.030	NA	
7	R7-3-9267t	1027345.300	1878531.400	688.1	1027345.353	1878531.418	689.028	0.053	0.018	0.928	All material was taken as targeted material
7	R7-3-9268t	1027352.800	1878541.900	GS	1027352.774	1878541.914	689.479	-0.026	0.014	NA	
7	R7-3-9276t	1027429.600	1878582.900	687.2	1027429.516	1878582.860	689.406	-0.084	-0.040	2.206	All material was taken as targeted material
7	R7-3-9287t	1027417.600	1878572.100	687.7	1027417.556	1878572.051	689.649	-0.044	-0.049	1.949	All material was taken as targeted material
7	R7-3-9288t	1027405.500	1878560.400	688.0	1027405.461	1878560.328	689.875	-0.039	-0.072	1.875	All material was taken as targeted material
7	R7-3-9289t	1027386.200	1878537.200	686.9	1027386.281	1878537.183	687.355	0.081	-0.017	0.455	
7	R7-3-9290t	1027333.400	1878516.200	687.2	1027333.340	1878516.189	688.045	-0.060	-0.011	0.845	All material was taken as targeted material
7	R7-3-9298t	1027463.700	1878573.500	687.6	1027463.733	1878573.530	689.280	0.033	0.030	1.680	All material was taken as targeted material
7	R7-3-9301t	1027492.700	1878603.600	688.4	1027492.644	1878603.677	688.858	-0.056	0.077	0.458	
7	R7-3-9304t	1027434.800	1878538.700	688.0	1027434.830	1878538.624	689.570	0.030	-0.076	1.570	All material was taken as targeted material
7	R7-3-9305t	1027501.200	1878611.700	687.2	1027501.173	1878611.686	687.637	-0.027	-0.014	0.437	
7	R7-3-9308t	1027454.700	1878612.900	687.1	1027454.764	1878612.987	687.246	0.064	0.087	0.146	
7	R7-3-9309t	1027466.000	1878623.900	687.6	1027465.913	1878623.907	687.990	-0.087	0.007	0.390	
7	R7-3-9315t	1027458.400	1878565.400	688.5	1027458.405	1878565.463	689.422	0.005	0.063	0.922	All material was taken as targeted material
7	R7-3-9325t	1027525.500	1878594.000	687.0	1027525.446	1878593.995	687.124	-0.054	-0.005	0.124	
7	R7-3-9327t	1027414.800	1878514.000	688.2	1027414.777	1878513.967	688.334	-0.023	-0.033	0.134	
7	R7-3-9332t	1027492.200	1878554.900	686.6	1027492.232	1878554.923	686.826	0.032	0.023	0.226	
7	R7-3-9337t	1027505.500	1878566.600	686.4	1027505.578	1878566.595	686.839	0.078	-0.005	0.439	
7	R7-3-9339t	1027516.000	1878580.100	687.9	1027516.022	1878580.136	688.034	0.022	0.036	0.134	
7	R7-3-9340t	1027356.700	1878453.300	686.6	1027356.649	1878453.318	686.924	-0.051	0.018	0.324	
7	R7-3-9343t	1027482.300	1878543.500	687.4	1027482.252	1878543.463	689.332	-0.048	-0.037	1.932	All material was taken as targeted material
7	R7-3-9344t	1027436.400	1878496.000	687.0	1027436.369	1878495.968	687.178	-0.031	-0.032	0.178	
7	R7-3-9345t	1027425.500	1878486.200	686.8	1027425.500	1878486.165	687.157	0.000	-0.035	0.357	
7	R7-3-9346t	1027412.600	1878468.700	686.4	1027412.636	1878468.688	686.839	0.036	-0.012	0.439	
7	R7-3-9347t	1027400.700	1878459.800	686.7	1027400.717	1878459.795	686.955	0.017	-0.005	0.255	
7	R7-3-9348t	1027456.500	1878516.200	687.5	1027456.462	1878516.262	687.970	-0.038	0.062	0.470	
7	R7-3-9349t	1027395.600	1878446.400	686.8	1027395.650	1878446.423	687.107	0.050	0.023	0.307	
7	R7-3-9350t	1027382.200	1878426.300	688.2	1027382.133	1878426.328	688.385	-0.067	0.028	0.185	
7	R7-3-9352t	1027447.400	1878507.300	687.5	1027447.368	1878507.349	688.530	-0.032	0.049	1.030	All material was taken as targeted material
7	R7-3-9354t	1027471.400	1878529.600	687.5	1027471.348	1878529.613	689.239	-0.052	0.013	1.739	All material was taken as targeted material
7	R7-3-9358t	1027445.800	1878551.800	688.3	1027445.754	1878551.739	689.810	-0.046	-0.061	1.510	All material was taken as targeted material
7	R7-3-9360t	1027399.700	1878499.600	687.0	1027399.785	1878499.618	687.400	0.085	0.018	0.400	
7	R7-3-9365t	1027390.200	1878488.900	686.7	1027390.142	1878488.886	686.977	-0.058	-0.014	0.277	
7	R7-3-9369t	1027425.500	1878529.000	688.6	1027425.525	1878529.078	689.294	0.025	0.078	0.694	All material was taken as targeted material

Δ Elevation > 0.5 ft Blue

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Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-9375t	1027377.000	1878474.200	686.5	1027377.002	1878474.277	686.863	.002	.077	.363	
7	R7-3-9377t	1027347.200	1878441.700	688.1	1027347.097	1878441.719	688.064	-.103	.019	-.036	
7	R7-3-9379t	1027371.100	1878466.800	686.5	1027371.129	1878466.806	686.635	.029	.006	.135	
7	R7-3-9418t	1027519.200	1878484.200	687.2	1027519.193	1878484.153	687.570	-.007	-.047	.370	
7	R7-3-9419t	1027409.000	1878411.800	688.4	1027409.000	1878411.839	688.822	.000	.039	.422	
7	R7-3-9421t	1027400.800	1878403.200	689.0	1027400.814	1878403.213	689.245	.014	.013	.245	
7	R7-3-9422t	1027481.200	1878496.200	687.2	1027481.120	1878496.217	687.316	-.080	.017	.116	
7	R7-3-9424t	1027539.200	1878511.900	686.6	1027539.136	1878511.864	686.610	-.064	-.036	.010	
7	R7-3-9425t	1027552.200	1878522.500	686.9	1027552.178	1878522.588	687.238	-.022	.088	.338	
7	R7-3-9426t	1027531.800	1878497.300	686.9	1027531.721	1878497.351	687.288	-.079	.051	.388	
7	R7-3-9427t	1027508.800	1878476.100	686.9	1027508.834	1878476.118	687.371	.034	.018	.471	
7	R7-3-9430t	1027437.900	1878446.700	686.5	1027437.958	1878446.762	686.937	.058	.062	.437	
7	R7-3-9431t	1027576.800	1878504.800	684.5	1027576.890	1878504.829	684.745	.090	.029	.245	
7	R7-3-9433t	1027566.600	1878492.500	686.0	1027566.628	1878492.477	686.389	.028	-.023	.389	
7	R7-3-9434t	1027525.200	1878547.400	686.7	1027525.234	1878547.406	687.051	.034	.006	.351	
7	R7-3-9439t	1027576.900	1878458.100	686.5	1027576.948	1878458.134	686.813	.048	.034	.313	
7	R7-3-9440t	1027499.800	1878463.300	686.9	1027499.783	1878463.294	687.283	-.017	-.006	.383	
7	R7-3-9445t	1027536.800	1878558.000	686.8	1027536.818	1878558.053	686.939	.018	.053	.139	
7	R7-3-9451t	1027422.400	1878424.000	687.8	1027422.321	1878423.968	688.266	-.079	-.032	.466	
7	R7-3-9453t	1027431.400	1878433.900	687.0	1027431.393	1878433.871	687.213	-.007	-.029	.213	
7	R7-3-9457t	1027505.800	1878520.900	686.7	1027505.834	1878520.843	687.173	.034	-.057	.473	
7	R7-3-9458t	1027514.300	1878534.200	686.6	1027514.293	1878534.159	686.947	-.007	-.041	.347	
7	R7-3-9459t	1027471.200	1878483.800	687.2	1027471.143	1878483.789	687.558	-.057	-.011	.358	
7	R7-3-9460t	1027461.100	1878473.500	686.6	1027461.142	1878473.525	686.930	.042	.025	.330	
7	R7-3-9461t	1027496.100	1878511.600	686.8	1027496.022	1878511.612	687.108	-.078	.012	.308	
7	R7-3-9462t	1027447.300	1878454.000	686.5	1027447.360	1878453.935	686.657	.060	-.065	.157	
7	R7-3-9496t	1027624.400	1878461.400	685.0	1027624.405	1878461.431	685.402	.005	.031	.402	
7	R7-3-9505t	1027639.200	1878428.400	686.2	1027639.280	1878428.379	686.446	.080	-.021	.246	
7	R7-3-9506t	1027649.000	1878436.300	685.5	1027648.933	1878436.365	685.623	-.067	.065	.123	
7	R7-3-9508t	1027616.100	1878447.000	685.8	1027616.078	1878447.040	685.905	-.022	.040	.105	
7	R7-3-9511t	1027648.200	1878484.000	GS	1027648.278	1878484.011	685.198	.078	.011	NA	
7	R7-3-9517t	1027609.800	1878496.600	684.2	1027609.901	1878496.625	684.337	.101	.025	.137	
7	R7-3-9521t	1027661.300	1878448.500	684.9	1027661.290	1878448.546	685.283	-.010	.046	.383	
7	R7-3-9548t	1027733.400	1878384.400	685.6	1027733.454	1878384.465	686.660	.054	.065	1.060	All material was taken as targeted material
7	R7-3-9550t	1027663.600	1878402.600	688.4	1027663.616	1878402.664	688.893	.016	.064	.493	
7	R7-3-9551t	1027717.600	1878404.800	685.5	1027717.511	1878404.804	686.251	-.089	.004	.751	All material was taken as targeted material
7	R7-3-9553t	1027649.200	1878399.800	688.2	1027649.159	1878399.859	688.590	-.041	.059	.390	

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-9559t	1027700.600	1878358.900	687.4	1027700.586	1878358.809	687.774	-0.014	-0.091	0.374	
7	R7-3-9560t	1027722.800	1878376.200	686.3	1027722.787	1878376.192	686.576	-0.013	-0.008	0.276	
7	R7-3-9561t	1027712.300	1878366.700	687.3	1027712.359	1878366.690	687.752	0.059	-0.010	0.452	
7	R7-3-9569t	1027678.200	1878419.800	685.3	1027678.189	1878419.833	687.100	-0.011	0.033	1.800	All material was taken as targeted material
7	R7-3-9571t	1027759.700	1878361.900	685.1	1027759.763	1878361.920	685.526	0.063	0.020	0.426	
7	R7-3-9577t	1027688.300	1878429.300	GS	1027688.264	1878429.236	685.952	-0.036	-0.064	NA	
7	R7-3-9597t	1027737.300	1878340.300	688.1	1027737.274	1878340.288	688.423	-0.026	-0.012	0.323	
7	R7-3-9599t	1027748.500	1878350.900	686.6	1027748.455	1878350.850	687.038	-0.045	-0.050	0.438	
7	R7-3-9614t	1027783.900	1878191.800	688.5	1027783.909	1878191.875	688.963	0.009	0.075	0.463	
7	R7-3-9615t	1027776.200	1878182.200	688.0	1027776.204	1878182.118	688.125	0.004	-0.082	0.125	
7	R7-3-9616t	1027764.800	1878167.200	688.4	1027764.794	1878167.182	688.605	-0.006	-0.018	0.205	
7	R7-3-9617t	1027753.500	1878157.200	689.3	1027753.488	1878157.223	689.305	-0.012	0.023	0.005	
7	R7-3-9618t	1027744.700	1878145.000	689.1	1027744.641	1878144.964	689.204	-0.059	-0.036	0.104	
7	R7-3-9620t	1027732.600	1878132.000	688.1	1027732.547	1878132.079	688.464	-0.053	0.079	0.364	
7	R7-3-9621t	1027776.100	1878286.300	685.7	1027776.095	1878286.238	685.909	-0.005	-0.062	0.209	
7	R7-3-9624t	1027824.800	1878238.000	684.7	1027824.782	1878238.003	686.416	-0.018	0.003	1.716	All material was taken as targeted material
7	R7-3-9625t	1027766.400	1878275.200	688.1	1027766.398	1878275.136	688.509	-0.002	-0.064	0.409	
7	R7-3-9626t	1027802.400	1878313.000	685.1	1027802.362	1878312.957	683.978	-0.038	-0.043	-1.122	Point was surveyed at existing ground surface
7	R7-3-9627t	1027821.100	1878218.800	685.5	1027821.080	1878218.742	687.069	-0.020	-0.058	1.569	All material was taken as targeted material
7	R7-3-9634t	1027792.000	1878302.400	683.8	1027792.078	1878302.323	684.238	0.078	-0.077	0.438	
7	R7-3-9639t	1027808.900	1878215.800	688.4	1027808.923	1878215.752	688.277	0.023	-0.048	-0.123	
7	R7-3-9643t	1027796.000	1878208.800	688.8	1027795.932	1878208.825	689.535	-0.068	0.025	0.735	All material was taken as targeted material
7	R7-3-9644t	1027687.400	1878381.500	688.3	1027687.313	1878381.497	689.781	-0.087	-0.003	1.481	All material was taken as targeted material
7	R7-3-9645t	1027701.800	1878396.200	686.0	1027701.741	1878396.295	687.967	-0.059	0.095	1.967	All material was taken as targeted material
7	R7-3-9655t	1027674.600	1878375.700	688.5	1027674.549	1878375.657	690.513	-0.051	-0.043	2.013	All material was taken as targeted material
7	R7-3-9657t	1027763.900	1878319.100	684.9	1027763.846	1878319.070	685.287	-0.054	-0.030	0.387	
7	R7-3-9658t	1027774.700	1878332.800	684.4	1027774.758	1878332.825	684.762	0.058	0.025	0.362	
7	R7-3-9699t	1027768.900	1878121.400	688.7	1027768.861	1878121.402	688.872	-0.039	0.002	0.172	
7	R7-3-9702t	1027850.400	1878222.400	684.7	1027850.441	1878222.395	685.515	0.041	-0.005	0.815	All material was taken as targeted material
7	R7-3-9705t	1027822.600	1878187.000	687.1	1027822.609	1878187.051	687.420	0.009	0.051	0.320	
7	R7-3-9706t	1027811.900	1878178.200	688.4	1027811.848	1878178.166	688.880	-0.052	-0.034	0.480	
7	R7-3-9707t	1027798.600	1878160.500	688.2	1027798.576	1878160.487	688.285	-0.024	-0.013	0.085	
7	R7-3-9708t	1027660.000	1878150.200	688.2	1027660.014	1878150.232	688.684	0.014	0.032	0.484	
7	R7-3-9709t	1027773.700	1878131.300	688.8	1027773.612	1878131.239	689.076	-0.088	-0.061	0.276	
7	R7-3-9713t	1027835.000	1878197.600	685.7	1027834.997	1878197.550	686.039	-0.003	-0.050	0.339	
7	R7-3-9717t	1027843.300	1878207.900	685.5	1027843.228	1878207.951	686.555	-0.072	0.051	1.055	All material was taken as targeted material
7	R7-3-9719t	1027788.000	1878149.900	687.9	1027788.031	1878149.854	688.016	0.031	-0.046	0.116	

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-9724t	1027671.600	1878165.400	688.5	1027671.589	1878165.421	688.847	-0.011	0.021	0.347	
7	R7-3-9725t	1027681.100	1878178.500	688.8	1027681.033	1878178.490	689.128	-0.067	-0.010	0.328	
7	R7-3-9726t	1027693.900	1878193.400	689.1	1027693.984	1878193.437	689.322	0.084	0.037	0.222	
7	R7-3-9732t	1027703.800	1878205.500	688.4	1027703.802	1878205.414	688.817	0.002	-0.086	0.417	
7	R7-3-9737t	1027737.900	1878236.000	687.2	1027737.851	1878235.986	687.690	-0.049	-0.014	0.490	
7	R7-3-9740t	1027773.400	1878229.700	688.0	1027773.434	1878229.620	689.539	0.034	-0.080	1.539	All material was taken as targeted material
7	R7-3-9744t	1027783.900	1878243.600	687.0	1027783.812	1878243.675	687.344	-0.088	0.075	0.344	
7	R7-3-9764t	1027869.800	1878194.200	685.2	1027869.750	1878194.182	685.273	-0.050	-0.018	0.073	
7	R7-3-9765t	1027833.300	1878150.600	688.7	1027833.257	1878150.623	689.100	-0.043	0.023	0.400	
7	R7-3-9766t	1027823.700	1878137.800	688.9	1027823.692	1878137.729	689.242	-0.008	-0.071	0.342	
7	R7-3-9767t	1027860.100	1878176.200	685.8	1027860.041	1878176.110	686.219	-0.059	-0.090	0.419	
7	R7-3-9768t	1027815.700	1878126.600	688.2	1027815.613	1878126.614	688.461	-0.087	0.014	0.261	
7	R7-3-9769t	1027803.700	1878114.400	687.2	1027803.670	1878114.481	687.304	-0.030	0.081	0.104	
7	R7-3-9770t	1027792.400	1878100.600	688.4	1027792.377	1878100.578	688.773	-0.023	-0.022	0.373	
7	R7-3-9772t	1027846.400	1878164.300	686.1	1027846.417	1878164.228	686.118	0.017	-0.072	0.018	
7	R7-3-9774t	1027693.700	1878142.700	688.7	1027693.677	1878142.611	689.043	-0.023	-0.089	0.343	
7	R7-3-9775t	1027748.900	1878202.200	688.2	1027748.925	1878202.262	688.494	0.025	0.062	0.294	
7	R7-3-9776t	1027740.300	1878191.900	688.8	1027740.328	1878191.823	689.224	0.028	-0.077	0.424	
7	R7-3-9777t	1027728.300	1878177.800	689.3	1027728.252	1878177.808	689.520	-0.048	0.008	0.220	
7	R7-3-9780t	1027715.700	1878163.600	689.3	1027715.708	1878163.521	689.785	0.008	-0.079	0.485	
7	R7-3-9782t	1027703.300	1878153.200	688.9	1027703.227	1878153.167	689.235	-0.073	-0.033	0.335	
7	R7-3-9798t	1027872.300	1878175.800	GS	1027872.316	1878175.735	686.378	0.016	-0.065	NA	
7	R7-3-9800t	1027856.200	1878126.100	687.2	1027856.126	1878126.070	687.659	-0.074	-0.030	0.459	
7	R7-3-9801t	1027814.900	1878099.000	688.0	1027814.976	1878098.966	688.558	0.076	-0.034	0.558	All material was taken as targeted material
7	R7-3-9802t	1027830.500	1878109.100	687.3	1027830.503	1878109.081	687.796	0.003	-0.019	0.496	
7	R7-3-9803t	1027842.900	1878118.300	688.0	1027842.860	1878118.276	688.170	-0.040	-0.024	0.170	
7	R7-3-9804t	1027871.600	1878136.800	685.2	1027871.621	1878136.801	685.447	0.021	0.001	0.247	
7	R7-3-9805t	1027899.500	1878152.700	685.3	1027899.470	1878152.742	685.388	-0.030	0.042	0.088	
7	R7-3-9806t	1027882.800	1878143.500	686.2	1027882.800	1878143.447	686.358	0.000	-0.053	0.158	
7	R7-3-9809t	1027793.900	1878255.000	685.7	1027793.807	1878254.943	686.180	-0.093	-0.057	0.480	
7	R7-3-9812t	1027807.000	1878254.800	685.4	1027806.948	1878254.724	685.707	-0.052	-0.076	0.307	
7	R7-3-9813t	1027821.800	1878267.500	684.0	1027821.724	1878267.485	684.986	-0.076	-0.015	0.986	All material was taken as targeted material
7	R7-3-9818t	1027857.600	1878165.700	685.6	1027857.536	1878165.751	686.072	-0.064	0.051	0.472	
7	R7-3-9876t	1027944.600	1877837.900	687.6	1027944.625	1877837.889	688.013	0.025	-0.011	0.413	
7	R7-3-9877t	1027969.300	1877926.800	686.5	1027969.334	1877926.845	686.856	0.034	0.045	0.356	
7	R7-3-9879t	1027953.100	1877919.300	685.2	1027953.109	1877919.233	685.664	0.009	-0.067	0.464	
7	R7-3-9880t	1027890.900	1878098.300	686.0	1027890.855	1878098.309	686.248	-0.045	0.009	0.248	

Δ Elevation > 0.5 ft Blue

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Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-9882t	1027986.300	1877862.500	685.8	1027986.231	1877862.520	686.226	-0.069	0.020	0.426	
7	R7-3-9886t	1027866.100	1878012.000	687.3	1027866.051	1878011.996	687.563	-0.049	-0.004	0.263	
7	R7-3-9889t	1027831.300	1878068.600	687.1	1027831.266	1878068.640	688.559	-0.034	0.040	1.459	All material was taken as targeted material
7	R7-3-9892t	1027900.400	1878112.700	685.5	1027900.454	1878112.616	685.862	0.054	-0.084	0.362	
7	R7-3-9893t	1027998.800	1877872.000	GS	1027998.860	1877871.950	687.302	0.060	-0.050	NA	
7	R7-3-9894t	1027850.000	1878078.600	686.9	1027850.061	1878078.574	688.396	0.061	-0.026	1.496	All material was taken as targeted material
7	R7-3-9897t	1027876.200	1878092.700	685.9	1027876.143	1878092.650	686.090	-0.057	-0.050	0.190	
7	R7-3-9898t	1027860.800	1878085.200	686.9	1027860.837	1878085.211	687.334	0.037	0.011	0.434	
7	R7-3-9900t	1027970.700	1877851.500	686.1	1027970.686	1877851.583	686.558	-0.014	0.083	0.458	
7	R7-3-9901t	1027955.400	1877843.900	686.7	1027955.372	1877843.851	686.901	-0.028	-0.049	0.201	
7	R7-3-9904t	1028006.800	1877795.300	685.5	1028006.725	1877795.362	685.815	-0.075	0.062	0.315	
7	R7-3-9909t	1027976.600	1877773.400	686.4	1027976.687	1877773.354	686.693	0.087	-0.046	0.293	
7	R7-3-9920t	1027938.800	1877986.800	686.1	1027938.713	1877986.832	686.435	-0.087	0.032	0.335	
7	R7-3-9926t	1027905.700	1878037.600	684.8	1027905.749	1878037.605	685.190	0.049	0.005	0.390	
7	R7-3-9927t	1027882.700	1878013.800	686.6	1027882.713	1878013.732	687.035	0.013	-0.068	0.435	
7	R7-3-9928t	1027900.500	1878016.300	686.4	1027900.488	1878016.262	686.565	-0.012	-0.038	0.165	
7	R7-3-9933t	1027924.100	1877977.800	685.4	1027924.127	1877977.737	685.618	0.027	-0.063	0.218	
7	R7-3-9934t	1027914.200	1877892.800	688.9	1027914.114	1877892.774	689.332	-0.086	-0.026	0.432	
7	R7-3-9936t	1027899.400	1877885.900	688.6	1027899.423	1877885.864	689.053	0.023	-0.036	0.453	
7	R7-3-9937t	1027885.300	1877881.500	688.6	1027885.272	1877881.541	688.925	-0.028	0.041	0.325	
7	R7-3-9938t	1027928.500	1877897.100	687.4	1027928.507	1877897.089	687.781	0.007	-0.011	0.381	
7	R7-3-9940t	1028018.300	1877804.400	GS	1028018.327	1877804.444	686.366	0.027	0.044	NA	
7	R7-3-9949t	1027992.200	1877786.200	685.4	1027992.237	1877786.153	685.879	0.037	-0.047	0.479	
7	R7-3-9957t	1028036.300	1877736.900	GS	1028036.275	1877736.871	686.451	-0.025	-0.029	NA	
7	R7-3-9960t	1028049.000	1877743.800	GS	1028049.058	1877743.749	686.559	0.058	-0.051	NA	
7	R7-3-9963t	1028007.300	1877750.200	GS	1028007.307	1877750.239	686.921	0.007	0.039	NA	
7	R7-3-9964t	1027969.900	1877745.700	687.5	1027969.850	1877745.746	687.771	-0.050	0.046	0.271	
7	R7-3-9966t	1027957.000	1877814.600	686.4	1027956.958	1877814.669	686.675	-0.042	0.069	0.275	
7	R7-3-9973t	1027968.400	1877821.900	686.0	1027968.334	1877821.894	686.383	-0.066	-0.006	0.383	
7	R7-3-9974t	1027989.300	1877823.500	685.8	1027989.263	1877823.490	686.228	-0.037	-0.010	0.428	
7	R7-3-9975t	1027987.200	1877746.900	685.9	1027987.246	1877746.844	686.298	0.046	-0.056	0.398	
7	R7-3-9976t	1027910.100	1877967.800	686.4	1027910.066	1877967.760	686.828	-0.034	-0.040	0.428	
7	R7-3-9978t	1027891.600	1877957.000	687.6	1027891.518	1877956.975	688.044	-0.082	-0.025	0.444	
7	R7-3-9979t	1027877.400	1877951.100	687.3	1027877.418	1877951.150	687.539	0.018	0.050	0.239	
7	R7-3-9985t	1028025.800	1877720.200	GS	1028025.722	1877720.221	687.491	-0.078	0.021	NA	
7	R7-3-9998t	1027985.200	1877896.100	686.5	1027985.261	1877896.056	686.903	0.061	-0.044	0.403	
7	R7-3-9999t	1027923.600	1877861.300	687.4	1027923.558	1877861.247	687.542	-0.042	-0.053	0.142	

Δ Elevation > 0.5 ft Blue

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-T1	1026901.700	1878907.100	687.1	1026901.642	1878907.063	687.535	-0.058	-0.037	0.435	
7	R7-3-T10	1026953.300	1878893.100	687.1	1026953.322	1878893.119	687.440	0.022	0.019	0.340	
7	R7-3-T100	1027327.900	1878687.400	687.1	1027327.930	1878687.436	687.335	0.030	0.036	0.235	
7	R7-3-T101	1026606.500	1878685.900	684.8	1026606.495	1878685.984	685.077	-0.005	0.084	0.277	
7	R7-3-T102	1026764.000	1878684.800	684.5	1026764.091	1878684.808	684.769	0.091	0.008	0.269	
7	R7-3-T103	1027325.900	1878684.400	687.1	1027325.912	1878684.356	687.216	0.012	-0.044	0.116	
7	R7-3-T104	1026772.100	1878679.400	684.5	1026772.099	1878679.382	684.757	-0.001	-0.018	0.257	
7	R7-3-T105	1027286.700	1878677.300	686.7	1027286.727	1878677.263	687.052	0.027	-0.037	0.352	
7	R7-3-T106	1026619.300	1878675.800	684.8	1026619.342	1878675.823	685.074	0.042	0.023	0.274	
7	R7-3-T107	1027319.600	1878675.600	686.9	1027319.685	1878675.583	687.259	0.085	-0.017	0.359	
7	R7-3-T108	1026654.000	1878673.100	685.1	1026653.953	1878673.079	685.185	-0.047	-0.021	0.085	
7	R7-3-T109	1027339.700	1878671.900	686.4	1027339.716	1878671.920	686.809	0.016	0.020	0.409	
7	R7-3-T111	1026777.800	1878891.700	688.0	1026777.763	1878891.704	688.341	-0.037	0.004	0.341	
7	R7-3-T110	1027294.300	1878669.000	687.7	1027294.262	1878669.047	688.065	-0.038	0.047	0.365	
7	R7-3-T111	1026800.900	1878667.100	GS	1026800.823	1878667.222	686.502	-0.077	0.122	NA	
7	R7-3-T112	1027315.900	1878666.600	687.7	1027315.907	1878666.588	688.065	0.007	-0.012	0.365	
7	R7-3-T113	1027345.800	1878664.800	686.4	1027345.854	1878664.825	686.630	0.054	0.025	0.230	
7	R7-3-T114	1027306.300	1878664.700	687.7	1027306.294	1878664.613	687.926	-0.006	-0.087	0.226	
7	R7-3-T115	1027333.500	1878663.100	686.4	1027333.524	1878663.044	686.568	0.024	-0.056	0.168	
7	R7-3-T116	1027329.200	1878657.000	687.3	1027329.284	1878657.013	687.676	0.084	0.013	0.376	
7	R7-3-T117	1027356.500	1878656.600	687.1	1027356.464	1878656.585	687.236	-0.036	-0.015	0.136	
7	R7-3-T118	1026807.500	1878655.400	GS	1026807.555	1878655.303	685.673	0.055	-0.097	NA	
7	R7-3-T119	1026676.500	1878654.000	686.4	1026676.539	1878653.948	686.825	0.039	-0.052	0.425	
7	R7-3-T12	1026875.200	1878891.700	688.2	1026875.168	1878891.676	688.613	-0.032	-0.024	0.413	
7	R7-3-T120	1026819.100	1878650.000	684.5	1026819.190	1878649.975	685.461	0.090	-0.025	0.961	All material was taken as targeted material
7	R7-3-T121	1026834.100	1878649.300	684.5	1026834.105	1878649.203	685.252	0.005	-0.097	0.752	All material was taken as targeted material
7	R7-3-T122	1026863.500	1878649.000	687.2	1026863.493	1878649.085	687.722	-0.007	0.085	0.522	All material was taken as targeted material
7	R7-3-T123	1026854.900	1878647.000	687.2	1026854.962	1878647.063	686.607	0.062	0.063	-0.593	Point was surveyed at existing ground surface
7	R7-3-T124	1027331.200	1878645.200	687.3	1027331.114	1878645.212	687.675	-0.086	0.012	0.375	
7	R7-3-T125	1027367.700	1878645.100	687.1	1027367.700	1878645.111	687.514	0.000	0.011	0.414	
7	R7-3-T126	1026715.200	1878644.600	GS	1026715.280	1878644.541	687.290	0.080	-0.059	NA	
7	R7-3-T127	1026868.000	1878642.100	686.3	1026867.963	1878642.138	686.729	-0.037	0.038	0.429	
7	R7-3-T128	1026851.700	1878638.400	GS	1026851.679	1878638.354	685.191	-0.021	-0.046	NA	
7	R7-3-T129	1027388.500	1878636.800	686.9	1027388.520	1878636.713	687.326	0.020	-0.087	0.426	
7	R7-3-T13	1026796.900	1878889.100	688.7	1026796.869	1878889.057	688.903	-0.031	-0.043	0.203	
7	R7-3-T130	1027432.000	1878636.500	687.5	1027432.018	1878636.493	687.752	0.018	-0.007	0.252	
7	R7-3-T131	1026902.400	1878636.400	686.6	1026902.466	1878636.471	689.217	0.066	0.071	2.617	All material was taken as targeted material

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-T132	1027341.500	1878633.700	687.5	1027341.463	1878633.731	687.943	-0.037	0.031	0.443	
7	R7-3-T133	1027471.400	1878632.500	685.6	1027471.450	1878632.446	686.045	0.050	-0.054	0.445	
7	R7-3-T134	1026746.800	1878631.600	686.4	1026746.828	1878631.618	686.854	0.028	0.018	0.454	
7	R7-3-T135	1026930.700	1878630.800	687.6	1026930.628	1878630.881	690.500	-0.072	0.081	2.900	All material was taken as targeted material
7	R7-3-T136	1026946.800	1878620.700	687.6	1026946.814	1878620.624	689.962	0.014	-0.076	2.362	All material was taken as targeted material
7	R7-3-T137	1026774.800	1878619.500	686.9	1026774.835	1878619.462	687.245	0.035	-0.038	0.345	
7	R7-3-T138	1027506.200	1878614.000	687.2	1027506.245	1878614.026	687.633	0.045	0.026	0.433	
7	R7-3-T139	1027357.800	1878611.600	688.6	1027357.815	1878611.579	688.916	0.015	-0.021	0.316	
7	R7-3-T14	1026852.200	1878887.200	688.6	1026852.272	1878887.182	688.992	0.072	-0.018	0.392	
7	R7-3-T140	1026948.800	1878606.100	GS	1026948.876	1878606.131	686.570	0.076	0.031	NA	
7	R7-3-T141	1026956.200	1878604.900	GS	1026956.264	1878604.915	686.752	0.064	0.015	NA	
7	R7-3-T142	1026804.500	1878604.000	686.5	1026804.562	1878604.020	687.980	0.062	0.020	1.480	All material was taken as targeted material
7	R7-3-T143	1027527.700	1878603.700	686.9	1027527.648	1878603.726	687.358	-0.052	0.026	0.458	
7	R7-3-T144	1027535.400	1878602.600	686.9	1027535.418	1878602.560	687.161	0.018	-0.040	0.261	
7	R7-3-T145	1027524.100	1878601.400	687.0	1027524.127	1878601.379	687.353	0.027	-0.021	0.353	
7	R7-3-T146	1027356.400	1878599.500	688.6	1027356.415	1878599.525	688.966	0.015	0.025	0.366	
7	R7-3-T147	1026821.000	1878599.300	686.0	1026821.049	1878599.265	687.775	0.049	-0.035	1.775	All material was taken as targeted material
7	R7-3-T148	1026992.300	1878593.900	685.8	1026992.307	1878593.933	686.913	0.007	0.033	1.113	All material was taken as targeted material
7	R7-3-T149	1027354.300	1878593.500	688.6	1027354.283	1878593.543	688.972	-0.017	0.043	0.372	
7	R7-3-T15	1026819.300	1878886.600	688.4	1026819.357	1878886.592	688.626	0.057	-0.008	0.226	
7	R7-3-T150	1026834.100	1878590.000	686.0	1026834.095	1878589.866	687.712	-0.005	-0.134	1.712	All material was taken as targeted material
7	R7-3-T151	1027336.300	1878583.900	688.0	1027336.283	1878583.934	688.281	-0.017	0.034	0.281	
7	R7-3-T152	1027358.800	1878583.400	688.1	1027358.787	1878583.361	688.134	-0.013	-0.039	0.034	
7	R7-3-T153	1027022.800	1878582.400	687.0	1027022.757	1878582.424	686.937	-0.043	0.024	-0.063	
7	R7-3-T154	1026868.500	1878582.200	685.3	1026868.428	1878582.252	686.710	-0.072	0.052	1.410	All material was taken as targeted material
7	R7-3-T155	1027049.600	1878573.000	686.1	1027049.662	1878572.971	687.279	0.062	-0.029	1.179	All material was taken as targeted material
7	R7-3-T156	1027550.400	1878570.100	686.8	1027550.347	1878570.058	687.055	-0.053	-0.042	0.255	
7	R7-3-T157	1027324.900	1878569.700	688.7	1027324.822	1878569.693	688.821	-0.078	-0.007	0.121	
7	R7-3-T158	1027280.300	1878568.100	688.9	1027280.384	1878568.152	690.879	0.084	0.052	1.979	All material was taken as targeted material
7	R7-3-T159	1027264.900	1878564.500	688.9	1027264.783	1878564.526	690.474	-0.117	0.026	1.574	All material was taken as targeted material
7	R7-3-T16	1027000.400	1878883.000	687.5	1027000.410	1878882.937	687.496	0.010	-0.063	-0.004	
7	R7-3-T160	1026895.400	1878564.000	GS	1026895.436	1878564.089	688.520	0.036	0.089	NA	
7	R7-3-T161	1026912.800	1878561.800	GS	1026912.864	1878561.889	687.237	0.064	0.089	NA	
7	R7-3-T162	1027086.000	1878559.000	685.7	1027086.029	1878559.020	687.135	0.029	0.020	1.435	All material was taken as targeted material
7	R7-3-T163	1026930.600	1878555.800	684.3	1026930.609	1878555.796	686.837	0.009	-0.004	2.537	All material was taken as targeted material
7	R7-3-T164	1027309.400	1878554.600	GS	1027309.420	1878554.518	689.596	0.020	-0.082	NA	
7	R7-3-T165	1027120.000	1878548.200	685.2	1027120.065	1878548.212	686.964	0.065	0.012	1.764	All material was taken as targeted material

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-T166	1027246.700	1878547.400	688.2	1027246.699	1878547.288	689.629	-0.001	-0.112	1.429	All material was taken as targeted material
7	R7-3-T167	1027226.700	1878545.200	688.3	1027226.727	1878545.235	689.375	0.027	0.035	1.075	All material was taken as targeted material
7	R7-3-T168	1026954.300	1878536.800	686.8	1026954.359	1878536.847	688.873	0.059	0.047	2.073	All material was taken as targeted material
7	R7-3-T169	1027565.100	1878536.700	684.9	1027565.052	1878536.744	685.062	-0.048	0.044	0.162	All material was taken as targeted material
7	R7-3-T17	1026752.600	1878881.500	687.9	1026752.586	1878881.434	688.301	-0.014	-0.066	0.401	
7	R7-3-T170	1027167.800	1878535.900	686.2	1027167.833	1878535.901	687.161	0.033	0.001	0.961	All material was taken as targeted material
7	R7-3-T171	1027183.900	1878534.600	686.2	1027183.926	1878534.622	687.257	0.026	0.022	1.057	All material was taken as targeted material
7	R7-3-T172	1027149.400	1878532.600	685.2	1027149.439	1878532.588	686.407	0.039	-0.012	1.207	All material was taken as targeted material
7	R7-3-T173	1026983.500	1878520.400	687.3	1026983.513	1878520.369	687.705	0.013	-0.031	0.405	
7	R7-3-T174	1027588.900	1878516.000	685.2	1027589.001	1878516.011	685.635	0.101	0.011	0.435	
7	R7-3-T175	1027262.400	1878514.400	686.7	1027262.345	1878514.495	687.136	-0.055	0.095	0.436	
7	R7-3-T176	1027618.000	1878505.900	684.1	1027617.923	1878505.936	684.418	-0.077	0.036	0.318	
7	R7-3-T177	1027271.000	1878505.100	686.7	1027270.976	1878505.135	686.840	-0.024	0.035	0.140	
7	R7-3-T178	1027015.300	1878503.200	687.1	1027015.274	1878503.210	687.553	-0.026	0.010	0.453	
7	R7-3-T179	1027264.600	1878499.700	GS	1027264.584	1878499.670	686.637	-0.016	-0.030	NA	
7	R7-3-T18	1026949.800	1878878.800	688.1	1026949.768	1878878.836	688.433	-0.032	0.036	0.333	
7	R7-3-T180	1027048.100	1878495.300	688.3	1027048.119	1878495.328	688.494	0.019	0.028	0.194	
7	R7-3-T181	1027043.000	1878492.700	688.3	1027042.956	1878492.700	688.745	-0.044	0.000	0.445	
7	R7-3-T182	1027643.600	1878491.700	GS	1027643.688	1878491.644	685.403	0.088	-0.056	NA	
7	R7-3-T183	1027655.300	1878491.200	683.6	1027655.210	1878491.210	685.812	-0.090	0.010	2.212	All material was taken as targeted material
7	R7-3-T184	1027640.700	1878489.400	GS	1027640.708	1878489.447	685.249	0.008	0.047	NA	
7	R7-3-T185	1027629.100	1878489.200	GS	1027629.118	1878489.247	685.236	0.018	0.047	NA	
7	R7-3-T186	1027673.300	1878489.100	683.8	1027673.246	1878489.003	687.333	-0.054	-0.097	3.533	All material was taken as targeted material
7	R7-3-T187	1027276.900	1878487.500	GS	1027276.938	1878487.482	686.361	0.038	-0.018	NA	
7	R7-3-T188	1027665.300	1878487.300	683.8	1027665.302	1878487.349	686.072	0.002	0.049	2.272	All material was taken as targeted material
7	R7-3-T189	1027175.100	1878487.100	GS	1027175.074	1878487.043	686.250	-0.026	-0.057	NA	
7	R7-3-T19	1026941.900	1878872.400	687.7	1026941.862	1878872.452	688.094	-0.038	0.052	0.394	
7	R7-3-T190	1027582.400	1878486.900	683.3	1027582.407	1878486.932	683.488	0.007	0.032	0.188	
7	R7-3-T191	1027190.800	1878485.900	GS	1027190.839	1878485.877	687.100	0.039	-0.023	NA	
7	R7-3-T192	1027083.700	1878485.700	686.4	1027083.747	1878485.733	686.686	0.047	0.033	0.286	
7	R7-3-T193	1027600.400	1878485.000	683.9	1027600.361	1878485.035	684.372	-0.039	0.035	0.472	
7	R7-3-T194	1027166.800	1878484.900	GS	1027166.787	1878484.983	686.367	-0.013	0.083	NA	
7	R7-3-T195	1027613.300	1878484.700	683.9	1027613.233	1878484.732	684.370	-0.067	0.032	0.470	
7	R7-3-T196	1027676.600	1878484.400	683.8	1027676.624	1878484.444	686.473	0.024	0.044	2.673	All material was taken as targeted material
7	R7-3-T197	1027555.200	1878482.100	684.8	1027555.211	1878482.102	685.059	0.011	0.002	0.259	
7	R7-3-T198	1027230.000	1878480.600	684.2	1027229.967	1878480.672	686.202	-0.033	0.072	2.002	All material was taken as targeted material
7	R7-3-T199	1027680.600	1878479.100	683.8	1027680.571	1878479.073	685.670	-0.029	-0.027	1.870	All material was taken as targeted material

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-T2	1026920.900	1878907.100	687.7	1026920.920	1878907.073	688.107	0.020	-0.027	0.407	
7	R7-3-T20	1026964.700	1878870.800	688.1	1026964.730	1878870.828	688.308	0.030	0.028	0.208	
7	R7-3-T200	1027642.200	1878477.600	GS	1027642.191	1878477.591	684.773	-0.009	-0.009	NA	
7	R7-3-T201	1027660.700	1878476.800	683.8	1027660.714	1878476.734	684.896	0.014	-0.066	1.096	All material was taken as targeted material
7	R7-3-T202	1027161.400	1878476.300	687.1	1027161.437	1878476.261	687.848	0.037	-0.039	0.748	All material was taken as targeted material
7	R7-3-T203	1027523.600	1878474.700	687.2	1027523.616	1878474.760	687.464	0.016	0.060	0.264	
7	R7-3-T204	1027245.300	1878472.900	684.2	1027245.291	1878472.896	686.640	-0.009	-0.004	2.440	All material was taken as targeted material
7	R7-3-T205	1027674.400	1878472.800	683.8	1027674.423	1878472.728	684.526	0.023	-0.072	0.726	All material was taken as targeted material
7	R7-3-T206	1027146.200	1878472.400	687.1	1027146.227	1878472.492	689.012	0.027	0.092	1.912	All material was taken as targeted material
7	R7-3-T207	1027542.300	1878472.100	684.0	1027542.295	1878472.024	687.408	-0.005	-0.076	3.408	All material was taken as targeted material
7	R7-3-T208	1027113.100	1878472.000	687.3	1027113.133	1878471.947	689.790	0.033	-0.053	2.490	All material was taken as targeted material
7	R7-3-T209	1027697.900	1878471.400	685.0	1027697.961	1878471.339	686.853	0.061	-0.061	1.853	All material was taken as targeted material
7	R7-3-T21	1026918.400	1878868.300	688.5	1026918.356	1878868.272	688.575	-0.044	-0.028	0.075	
7	R7-3-T210	1027587.700	1878471.100	684.9	1027587.747	1878471.074	685.106	0.047	-0.026	0.206	
7	R7-3-T211	1027613.400	1878468.600	684.8	1027613.460	1878468.643	685.124	0.060	0.043	0.324	
7	R7-3-T212	1027683.900	1878466.900	685.0	1027683.930	1878466.982	684.368	0.030	0.082	-0.632	Point was surveyed at existing ground surface
7	R7-3-T213	1027640.600	1878466.600	684.1	1027640.656	1878466.636	684.510	0.056	0.036	0.410	
7	R7-3-T214	1027630.300	1878466.300	684.1	1027630.309	1878466.334	684.404	0.009	0.034	0.304	
7	R7-3-T215	1027511.700	1878465.900	686.9	1027511.644	1878465.908	687.167	-0.056	0.008	0.267	
7	R7-3-T216	1027703.900	1878465.800	683.2	1027703.832	1878465.825	686.477	-0.068	0.025	3.277	All material was taken as targeted material
7	R7-3-T217	1027563.600	1878460.900	684.0	1027563.513	1878460.843	685.279	-0.087	-0.057	1.279	All material was taken as targeted material
7	R7-3-T218	1027654.400	1878460.700	684.9	1027654.329	1878460.707	684.965	-0.071	0.007	0.065	
7	R7-3-T219	1027710.100	1878460.000	683.2	1027710.041	1878459.979	686.061	-0.059	-0.021	2.861	All material was taken as targeted material
7	R7-3-T22	1027026.100	1878864.900	687.1	1027026.128	1878864.895	687.222	0.028	-0.005	0.122	
7	R7-3-T220	1027279.700	1878459.200	686.2	1027279.733	1878459.224	687.555	0.033	0.024	1.355	All material was taken as targeted material
7	R7-3-T221	1027672.100	1878458.200	683.6	1027672.140	1878458.259	684.509	0.040	0.059	0.909	All material was taken as targeted material
7	R7-3-T222	1027568.800	1878455.900	686.5	1027568.736	1878455.927	686.662	-0.064	0.027	0.162	
7	R7-3-T223	1027575.800	1878455.400	686.5	1027575.863	1878455.488	686.747	0.063	0.088	0.247	
7	R7-3-T224	1027484.100	1878452.600	686.1	1027484.122	1878452.656	686.540	0.022	0.056	0.440	
7	R7-3-T225	1027504.400	1878452.600	685.3	1027504.362	1878452.607	685.502	-0.038	0.007	0.202	
7	R7-3-T226	1027290.500	1878449.900	686.2	1027290.537	1878449.854	688.891	0.037	-0.046	2.691	All material was taken as targeted material
7	R7-3-T227	1027698.900	1878449.000	683.2	1027698.932	1878449.076	684.102	0.032	0.076	0.902	All material was taken as targeted material
7	R7-3-T228	1027596.100	1878447.100	685.4	1027596.116	1878447.097	685.827	0.016	-0.003	0.427	
7	R7-3-T229	1027729.500	1878446.600	682.5	1027729.433	1878446.656	686.886	-0.067	0.056	4.386	All material was taken as targeted material
7	R7-3-T23	1026974.200	1878864.400	686.8	1026974.143	1878864.459	686.764	-0.057	0.059	-0.036	
7	R7-3-T230	1027605.700	1878446.000	685.4	1027605.612	1878445.975	685.736	-0.088	-0.025	0.336	
7	R7-3-T231	1027305.800	1878445.400	687.7	1027305.867	1878445.443	689.100	0.067	0.043	1.400	All material was taken as targeted material

Δ Elevation > 0.5 ft Blue

Δ Elevation < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-T232	1027601.900	1878443.500	685.4	1027601.969	1878443.543	685.838	0.069	0.043	0.438	
7	R7-3-T233	1027613.700	1878443.300	685.8	1027613.744	1878443.290	686.061	0.044	-0.010	0.261	
7	R7-3-T234	1027473.400	1878442.000	686.6	1027473.395	1878441.968	686.828	-0.005	-0.032	0.228	
7	R7-3-T235	1027735.900	1878440.100	682.5	1027735.877	1878440.107	686.816	-0.023	0.007	4.316	All material was taken as targeted material
7	R7-3-T236	1027697.900	1878438.600	684.0	1027697.930	1878438.561	684.751	0.030	-0.039	0.751	All material was taken as targeted material
7	R7-3-T237	1027722.500	1878438.200	682.5	1027722.449	1878438.127	683.625	-0.051	-0.073	1.125	All material was taken as targeted material
7	R7-3-T238	1027337.700	1878433.600	687.5	1027337.757	1878433.694	687.758	0.057	0.094	0.258	
7	R7-3-T239	1027698.200	1878431.400	684.0	1027698.218	1878431.358	685.134	0.018	-0.042	1.134	All material was taken as targeted material
7	R7-3-T24	1026743.700	1878862.500	688.5	1026743.699	1878862.487	688.689	-0.001	-0.013	0.189	
7	R7-3-T240	1027731.500	1878431.000	682.5	1027731.489	1878431.072	684.007	-0.011	0.072	1.507	All material was taken as targeted material
7	R7-3-T241	1027461.300	1878427.600	687.6	1027461.279	1878427.587	687.991	-0.021	-0.013	0.391	
7	R7-3-T242	1027711.300	1878426.900	683.1	1027711.224	1878426.922	684.665	-0.076	0.022	1.565	All material was taken as targeted material
7	R7-3-T243	1027633.000	1878425.100	686.2	1027632.970	1878425.190	686.464	-0.030	0.090	0.264	
7	R7-3-T244	1027639.800	1878420.200	686.2	1027639.746	1878420.178	686.584	-0.054	-0.022	0.384	
7	R7-3-T245	1027720.300	1878420.000	683.1	1027720.211	1878419.998	684.724	-0.089	-0.002	1.624	All material was taken as targeted material
7	R7-3-T246	1027370.900	1878418.700	688.7	1027370.934	1878418.724	688.891	0.034	0.024	0.191	
7	R7-3-T247	1027450.700	1878416.200	688.7	1027450.758	1878416.166	689.041	0.058	-0.034	0.341	
7	R7-3-T248	1027727.200	1878406.900	685.1	1027727.209	1878406.935	685.414	0.009	0.035	0.314	
7	R7-3-T249	1027644.800	1878406.000	688.2	1027644.832	1878406.056	688.261	0.032	0.056	0.061	
7	R7-3-T25	1026881.500	1878862.000	688.4	1026881.520	1878861.927	688.750	0.020	-0.073	0.350	
7	R7-3-T250	1027440.400	1878401.400	687.9	1027440.393	1878401.426	688.257	-0.007	0.026	0.357	
7	R7-3-T251	1027391.200	1878396.800	689.2	1027391.267	1878396.809	689.586	0.067	0.009	0.386	
7	R7-3-T252	1027643.200	1878396.600	688.2	1027643.237	1878396.653	688.458	0.037	0.053	0.258	
7	R7-3-T253	1027738.700	1878393.400	684.5	1027738.712	1878393.423	685.675	0.012	0.023	1.175	All material was taken as targeted material
7	R7-3-T254	1027760.700	1878388.400	684.4	1027760.724	1878388.346	683.923	0.024	-0.054	-0.477	Point was surveyed at existing ground surface
7	R7-3-T255	1027435.800	1878386.900	688.2	1027435.757	1878386.886	688.579	-0.043	-0.014	0.379	
7	R7-3-T256	1027399.000	1878379.700	689.1	1027398.998	1878379.637	689.505	-0.002	-0.063	0.405	
7	R7-3-T257	1027671.800	1878375.000	688.5	1027671.837	1878375.019	690.205	0.037	0.019	1.705	All material was taken as targeted material
7	R7-3-T258	1027431.600	1878370.300	688.4	1027431.605	1878370.243	688.857	0.005	-0.057	0.457	
7	R7-3-T259	1027762.400	1878365.400	685.1	1027762.408	1878365.342	685.304	0.008	-0.058	0.204	
7	R7-3-T26	1026724.900	1878859.200	687.7	1026724.884	1878859.235	688.090	-0.016	0.035	0.390	
7	R7-3-T260	1027683.900	1878363.900	689.6	1027683.854	1878363.829	689.759	-0.046	-0.071	0.159	
7	R7-3-T261	1027771.500	1878360.000	685.1	1027771.466	1878360.044	684.554	-0.034	0.044	-0.546	Point was surveyed at existing ground surface
7	R7-3-T262	1027409.200	1878359.200	688.7	1027409.119	1878359.168	689.060	-0.081	-0.032	0.360	
7	R7-3-T263	1027696.900	1878355.500	687.4	1027696.921	1878355.560	687.766	0.021	0.060	0.366	
7	R7-3-T264	1027422.600	1878353.600	689.0	1027422.565	1878353.558	689.392	-0.035	-0.042	0.392	
7	R7-3-T265	1027673.200	1878353.300	689.6	1027673.104	1878353.319	692.619	-0.096	0.019	3.019	All material was taken as targeted material

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-T266	1027769.900	1878349.300	685.1	1027769.945	1878349.313	685.368	0.045	0.013	0.268	
7	R7-3-T267	1027690.200	1878348.900	691.9	1027690.263	1878348.862	691.008	0.063	-0.038	-0.892	Point was surveyed at existing ground surface
7	R7-3-T268	1027707.700	1878346.300	687.4	1027707.782	1878346.287	687.811	0.082	-0.013	0.411	
7	R7-3-T269	1027695.100	1878342.800	691.9	1027695.052	1878342.757	691.506	-0.048	-0.043	-0.394	Point was surveyed at existing ground surface
7	R7-3-T27	1026958.800	1878858.300	687.2	1026958.759	1878858.277	687.316	-0.041	-0.023	0.116	
7	R7-3-T270	1027428.000	1878342.600	689.0	1027427.949	1878342.649	689.304	-0.051	0.049	0.304	
7	R7-3-T271	1027416.500	1878341.500	689.0	1027416.532	1878341.590	689.327	0.032	0.090	0.327	
7	R7-3-T272	1027729.800	1878340.400	688.1	1027729.791	1878340.347	688.276	-0.009	-0.053	0.176	
7	R7-3-T273	1027735.100	1878337.800	688.1	1027735.071	1878337.846	688.537	-0.029	0.046	0.437	
7	R7-3-T274	1027678.200	1878335.800	691.4	1027678.151	1878335.820	691.774	-0.049	0.020	0.374	
7	R7-3-T275	1027724.200	1878334.700	687.1	1027724.177	1878334.629	687.524	-0.023	-0.071	0.424	
7	R7-3-T276	1027777.400	1878334.700	684.4	1027777.441	1878334.630	684.714	0.041	-0.070	0.314	
7	R7-3-T277	1027717.600	1878334.500	687.1	1027717.531	1878334.532	687.569	-0.069	0.032	0.469	
7	R7-3-T278	1027705.000	1878331.000	688.6	1027704.989	1878331.025	688.705	-0.011	0.025	0.105	
7	R7-3-T279	1027429.000	1878326.800	688.5	1027428.979	1878326.719	688.727	-0.021	-0.081	0.227	
7	R7-3-T28	1026708.200	1878856.800	687.7	1026708.231	1878856.748	687.978	0.031	-0.052	0.278	
7	R7-3-T280	1027710.400	1878325.500	687.9	1027710.411	1878325.428	687.908	0.011	-0.072	0.008	
7	R7-3-T281	1027418.200	1878324.100	688.5	1027418.237	1878324.107	688.571	0.037	0.007	0.071	
7	R7-3-T282	1027739.300	1878323.700	688.2	1027739.269	1878323.677	688.371	-0.031	-0.023	0.171	
7	R7-3-T283	1027683.000	1878318.900	688.4	1027682.913	1878318.867	688.565	-0.087	-0.033	0.165	
7	R7-3-T284	1027806.500	1878315.600	685.1	1027806.440	1878315.596	685.178	-0.060	-0.004	0.078	
7	R7-3-T285	1027751.700	1878308.700	686.7	1027751.740	1878308.726	686.635	0.040	0.026	-0.065	
7	R7-3-T286	1027424.500	1878307.500	687.2	1027424.563	1878307.435	687.649	0.063	-0.065	0.449	
7	R7-3-T287	1027717.500	1878307.500	687.5	1027717.474	1878307.586	687.588	-0.026	0.086	0.088	
7	R7-3-T288	1027682.900	1878306.300	692.2	1027682.936	1878306.249	691.966	0.036	-0.051	-0.234	
7	R7-3-T289	1027440.700	1878302.600	687.2	1027440.672	1878302.583	687.541	-0.028	-0.017	0.341	
7	R7-3-T29	1026949.400	1878852.700	687.2	1026949.479	1878852.726	687.623	0.079	0.026	0.423	
7	R7-3-T290	1027755.200	1878301.300	686.8	1027755.188	1878301.378	687.255	-0.012	0.078	0.455	
7	R7-3-T291	1027750.400	1878299.400	686.8	1027750.451	1878299.478	687.268	0.051	0.078	0.468	
7	R7-3-T292	1027719.800	1878298.800	687.5	1027719.792	1878298.748	687.546	-0.008	-0.052	0.046	
7	R7-3-T293	1027425.600	1878296.100	687.2	1027425.685	1878296.098	687.524	0.085	-0.002	0.324	
7	R7-3-T294	1027444.700	1878294.900	687.2	1027444.707	1878294.841	687.222	0.007	-0.059	0.022	
7	R7-3-T295	1027682.700	1878294.300	692.2	1027682.736	1878294.294	692.274	0.036	-0.006	0.074	
7	R7-3-T296	1027714.500	1878292.700	687.9	1027714.506	1878292.647	688.289	0.006	-0.053	0.389	
7	R7-3-T297	1027491.500	1878292.300	688.9	1027491.440	1878292.357	689.308	-0.060	0.057	0.408	
7	R7-3-T298	1027431.900	1878292.200	687.2	1027431.971	1878292.184	687.540	0.071	-0.016	0.340	
7	R7-3-T299	1027512.600	1878291.700	689.3	1027512.593	1878291.709	689.209	-0.007	0.009	-0.091	

Δ Elevation > 0.5 ft Blue

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Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-T3	1026765.800	1878905.600	688.0	1026765.813	1878905.594	688.294	0.013	-0.006	0.294	
7	R7-3-T30	1026964.800	1878852.000	687.2	1026964.715	1878851.978	687.162	-0.085	-0.022	-0.038	
7	R7-3-T300	1027826.100	1878291.400	683.0	1027826.069	1878291.470	686.532	-0.031	0.070	3.532	All material was taken as targeted material
7	R7-3-T301	1027495.900	1878290.400	688.9	1027495.925	1878290.419	689.281	0.025	0.019	0.381	
7	R7-3-T302	1027700.900	1878289.200	688.0	1027700.918	1878289.195	688.113	0.018	-0.005	0.113	
7	R7-3-T303	1027552.300	1878288.800	687.7	1027552.170	1878288.806	688.109	-0.130	0.006	0.409	
7	R7-3-T304	1027758.100	1878286.100	688.5	1027758.005	1878286.158	688.833	-0.095	0.058	0.333	
7	R7-3-T305	1027483.700	1878284.400	688.5	1027483.664	1878284.445	688.656	-0.036	0.045	0.156	
7	R7-3-T306	1027717.300	1878283.900	689.1	1027717.303	1878283.892	689.235	0.003	-0.008	0.135	
7	R7-3-T307	1027823.100	1878282.700	683.0	1027823.058	1878282.680	684.343	-0.042	-0.020	1.343	All material was taken as targeted material
7	R7-3-T308	1027468.400	1878282.600	GS	1027468.332	1878282.576	689.386	-0.068	-0.024	NA	
7	R7-3-T309	1027760.900	1878279.200	688.1	1027760.810	1878279.117	688.579	-0.090	-0.083	0.479	
7	R7-3-T31	1026864.000	1878851.300	688.1	1026864.052	1878851.330	688.204	0.052	0.030	0.104	
7	R7-3-T310	1027719.800	1878276.100	689.1	1027719.851	1878276.112	689.442	0.051	0.012	0.342	
7	R7-3-T311	1027823.500	1878274.100	684.0	1027823.483	1878274.111	684.331	-0.017	0.011	0.331	
7	R7-3-T312	1027754.100	1878271.800	687.9	1027754.089	1878271.881	688.080	-0.011	0.081	0.180	
7	R7-3-T313	1027455.400	1878271.600	GS	1027455.388	1878271.657	688.069	-0.012	0.057	NA	
7	R7-3-T314	1027712.700	1878270.600	689.0	1027712.651	1878270.521	689.049	-0.049	-0.079	0.049	
7	R7-3-T315	1027829.400	1878268.800	684.0	1027829.400	1878268.867	684.234	0.000	0.067	0.234	
7	R7-3-T316	1027578.700	1878267.300	689.0	1027578.720	1878267.330	689.258	0.020	0.030	0.258	
7	R7-3-T317	1027758.700	1878263.800	687.9	1027758.735	1878263.835	687.918	0.035	0.035	0.018	
7	R7-3-T318	1027467.000	1878256.600	687.4	1027467.009	1878256.520	687.460	0.009	-0.080	0.060	
7	R7-3-T319	1027837.000	1878255.200	684.0	1027836.932	1878255.252	684.489	-0.068	0.052	0.489	
7	R7-3-T32	1027051.100	1878849.000	687.3	1027051.088	1878849.057	687.304	-0.012	0.057	0.004	
7	R7-3-T320	1027770.300	1878252.100	687.0	1027770.342	1878252.005	687.419	0.042	-0.095	0.419	
7	R7-3-T321	1027736.600	1878250.400	686.9	1027736.522	1878250.361	687.184	-0.078	-0.039	0.284	
7	R7-3-T322	1027733.700	1878248.100	686.9	1027733.742	1878248.018	687.272	0.042	-0.082	0.372	
7	R7-3-T323	1027744.800	1878247.000	686.9	1027744.813	1878246.923	686.984	0.013	-0.077	0.084	
7	R7-3-T324	1027842.800	1878242.100	684.4	1027842.878	1878242.031	684.769	0.078	-0.069	0.369	
7	R7-3-T325	1027475.400	1878240.200	687.4	1027475.422	1878240.264	687.640	0.022	0.064	0.240	
7	R7-3-T326	1027641.800	1878238.200	689.3	1027641.813	1878238.284	689.755	0.013	0.084	0.455	
7	R7-3-T327	1027735.400	1878235.300	687.2	1027735.459	1878235.332	687.655	0.059	0.032	0.455	
7	R7-3-T328	1027603.400	1878232.800	688.8	1027603.418	1878232.852	688.966	0.018	0.052	0.166	
7	R7-3-T329	1027857.300	1878231.700	683.6	1027857.251	1878231.763	685.733	-0.049	0.063	2.133	All material was taken as targeted material
7	R7-3-T33	1026707.500	1878848.300	687.7	1026707.494	1878848.306	687.982	-0.006	0.006	0.282	
7	R7-3-T330	1027760.800	1878221.900	687.8	1027760.812	1878221.927	688.284	0.012	0.027	0.484	
7	R7-3-T331	1027728.600	1878220.800	689.1	1027728.619	1878220.777	689.430	0.019	-0.023	0.330	

Δ Elevation > 0.5 ft Blue

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Δ Elevation 0.5 to -0.25 ft Green

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-T332	1027660.800	1878219.600	688.4	1027660.741	1878219.600	688.707	-0.059	0.000	0.307	
7	R7-3-T333	1027875.300	1878218.900	684.7	1027875.330	1878218.960	684.758	0.030	0.060	0.058	
7	R7-3-T334	1027481.700	1878218.800	687.6	1027481.751	1878218.849	687.718	0.051	0.049	0.118	
7	R7-3-T335	1027766.100	1878218.800	688.0	1027766.107	1878218.847	688.492	0.007	0.047	0.492	
7	R7-3-T336	1027672.100	1878218.600	688.4	1027672.079	1878218.554	688.743	-0.021	-0.046	0.343	
7	R7-3-T337	1027760.200	1878216.300	688.7	1027760.120	1878216.387	689.164	-0.080	0.087	0.464	
7	R7-3-T338	1027693.400	1878215.600	689.0	1027693.312	1878215.587	689.338	-0.088	-0.013	0.338	
7	R7-3-T339	1027767.900	1878213.300	689.2	1027767.912	1878213.375	689.108	0.012	0.075	-0.092	
7	R7-3-T34	1026948.900	1878848.300	689.8	1026948.813	1878848.244	690.034	-0.087	-0.056	0.234	
7	R7-3-T340	1027707.700	1878209.600	688.4	1027707.696	1878209.674	688.565	-0.004	0.074	0.165	
7	R7-3-T341	1027491.200	1878205.900	689.3	1027491.217	1878205.842	689.537	0.017	-0.058	0.237	
7	R7-3-T342	1027879.200	1878204.800	684.7	1027879.216	1878204.742	684.928	0.016	-0.058	0.228	
7	R7-3-T343	1027873.800	1878195.700	685.2	1027873.706	1878195.694	685.062	-0.094	-0.006	-0.138	
7	R7-3-T344	1027527.000	1878189.100	688.6	1027527.062	1878189.145	689.053	0.062	0.045	0.453	
7	R7-3-T345	1027548.700	1878182.700	688.5	1027548.608	1878182.672	688.836	-0.092	-0.028	0.336	
7	R7-3-T346	1027891.600	1878181.500	684.5	1027891.606	1878181.540	684.795	0.006	0.040	0.295	
7	R7-3-T347	1027555.900	1878180.000	688.5	1027555.943	1878180.065	688.899	0.043	0.065	0.399	
7	R7-3-T348	1027534.400	1878179.800	688.5	1027534.401	1878179.817	688.795	0.001	0.017	0.295	
7	R7-3-T349	1027878.600	1878179.600	684.5	1027878.600	1878179.591	684.587	0.000	-0.009	0.087	
7	R7-3-T35	1027073.600	1878844.900	687.0	1027073.625	1878844.905	687.179	0.025	0.005	0.179	
7	R7-3-T350	1027898.100	1878176.000	684.2	1027898.024	1878176.062	684.638	-0.076	0.062	0.438	
7	R7-3-T351	1027557.000	1878172.100	688.4	1027556.966	1878172.111	688.492	-0.034	0.011	0.092	
7	R7-3-T352	1027548.900	1878163.200	688.4	1027548.868	1878163.209	688.498	-0.032	0.009	0.098	
7	R7-3-T353	1027561.300	1878160.000	688.4	1027561.292	1878160.006	688.580	-0.008	0.006	0.180	
7	R7-3-T354	1027550.000	1878159.100	688.4	1027550.059	1878159.149	688.779	0.059	0.049	0.379	
7	R7-3-T355	1027907.000	1878156.500	685.3	1027906.985	1878156.460	685.450	-0.015	-0.040	0.150	
7	R7-3-T356	1027574.400	1878152.300	689.0	1027574.357	1878152.270	689.106	-0.043	-0.030	0.106	
7	R7-3-T357	1027614.500	1878144.700	688.5	1027614.454	1878144.668	688.790	-0.046	-0.032	0.290	
7	R7-3-T358	1027651.000	1878143.100	687.8	1027650.937	1878143.093	688.255	-0.063	-0.007	0.455	
7	R7-3-T359	1027641.200	1878142.800	688.0	1027641.117	1878142.738	688.098	-0.083	-0.062	0.098	
7	R7-3-T36	1026954.100	1878840.900	689.8	1026954.048	1878840.845	690.148	-0.052	-0.055	0.348	
7	R7-3-T360	1027636.400	1878137.400	688.0	1027636.381	1878137.346	688.313	-0.019	-0.054	0.313	
7	R7-3-T361	1027908.300	1878135.400	685.3	1027908.297	1878135.406	685.763	-0.003	0.006	0.463	
7	R7-3-T362	1027685.900	1878133.600	687.7	1027685.930	1878133.677	688.012	0.030	0.077	0.312	
7	R7-3-T363	1027724.900	1878125.400	688.2	1027724.847	1878125.407	688.345	-0.053	0.007	0.145	
7	R7-3-T364	1027762.800	1878112.000	687.4	1027762.874	1878111.952	687.847	0.074	-0.048	0.447	
7	R7-3-T365	1027910.800	1878109.100	685.5	1027910.761	1878109.096	685.981	-0.039	-0.004	0.481	

Δ Elevation > 0.5 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-T366	1027774.200	1878099.600	687.4	1027774.280	1878099.634	687.754	0.080	0.034	0.354	
7	R7-3-T367	1027920.400	1878097.800	685.5	1027920.370	1878097.846	685.715	-0.030	0.046	0.215	
7	R7-3-T368	1027789.700	1878094.400	688.4	1027789.771	1878094.470	688.615	0.071	0.070	0.215	
7	R7-3-T369	1027807.900	1878093.700	688.0	1027807.906	1878093.712	688.540	0.006	0.012	0.540	All material was taken as targeted material
7	R7-3-T37	1026960.600	1878839.000	689.8	1026960.567	1878839.031	689.868	-0.033	0.031	0.068	
7	R7-3-T370	1027901.000	1878092.800	686.0	1027900.959	1878092.840	686.162	-0.041	0.040	0.162	
7	R7-3-T371	1027909.600	1878080.500	685.4	1027909.553	1878080.481	685.555	-0.047	-0.019	0.155	
7	R7-3-T372	1027910.000	1878074.300	685.4	1027910.034	1878074.293	685.756	0.034	-0.007	0.356	
7	R7-3-T373	1027825.500	1878067.100	687.1	1027825.466	1878067.074	688.847	-0.034	-0.026	1.747	All material was taken as targeted material
7	R7-3-T374	1027916.800	1878049.700	685.6	1027916.788	1878049.730	685.698	-0.012	0.030	0.098	
7	R7-3-T375	1027842.300	1878041.800	687.1	1027842.335	1878041.781	687.489	0.035	-0.019	0.389	
7	R7-3-T376	1027934.100	1878016.600	685.0	1027934.109	1878016.562	685.458	0.009	-0.038	0.458	
7	R7-3-T377	1027861.000	1878010.700	687.3	1027861.003	1878010.777	687.609	0.003	0.077	0.309	
7	R7-3-T378	1027938.300	1878010.200	685.1	1027938.258	1878010.223	685.505	-0.042	0.023	0.405	
7	R7-3-T379	1027953.100	1878001.000	685.1	1027953.101	1878000.960	685.468	0.001	-0.040	0.368	
7	R7-3-T38	1026853.900	1878837.200	688.5	1026853.888	1878837.172	688.731	-0.012	-0.028	0.231	
7	R7-3-T380	1027858.400	1877993.900	688.8	1027858.383	1877993.868	689.183	-0.017	-0.032	0.383	
7	R7-3-T381	1027942.900	1877987.200	686.1	1027942.893	1877987.231	686.465	-0.007	0.031	0.365	
7	R7-3-T382	1027849.900	1877973.100	688.7	1027849.842	1877973.062	689.171	-0.058	-0.038	0.471	
7	R7-3-T383	1027955.100	1877958.400	685.7	1027955.046	1877958.415	686.075	-0.054	0.015	0.375	
7	R7-3-T384	1027872.600	1877947.500	687.3	1027872.639	1877947.477	687.566	0.039	-0.023	0.266	
7	R7-3-T385	1027972.800	1877927.600	686.5	1027972.721	1877927.598	686.956	-0.079	-0.002	0.456	
7	R7-3-T386	1027868.700	1877914.200	686.9	1027868.604	1877914.159	687.301	-0.096	-0.041	0.401	
7	R7-3-T387	1027999.000	1877900.300	685.0	1027999.051	1877900.290	685.259	0.051	-0.010	0.259	
7	R7-3-T388	1027880.200	1877883.900	688.6	1027880.237	1877883.945	689.028	0.037	0.045	0.428	
7	R7-3-T389	1027895.500	1877881.800	688.6	1027895.488	1877881.751	689.013	-0.012	-0.049	0.413	
7	R7-3-T39	1026839.300	1878831.100	688.5	1026839.235	1878831.116	688.837	-0.065	0.016	0.337	
7	R7-3-T390	1027877.400	1877879.800	688.6	1027877.393	1877879.750	688.842	-0.007	-0.050	0.242	
7	R7-3-T391	1027888.500	1877879.600	688.6	1027888.543	1877879.572	688.981	0.043	-0.028	0.381	
7	R7-3-T392	1027886.700	1877875.700	688.6	1027886.763	1877875.746	688.719	0.063	0.046	0.119	
7	R7-3-T393	1027908.800	1877874.400	688.6	1027908.816	1877874.472	688.852	0.016	0.072	0.252	
7	R7-3-T394	1028004.700	1877873.900	GS	1028004.679	1877873.839	687.453	-0.021	-0.061	NA	
7	R7-3-T395	1027901.500	1877871.600	688.6	1027901.503	1877871.521	688.885	0.003	-0.079	0.285	
7	R7-3-T396	1027922.400	1877860.600	687.4	1027922.441	1877860.541	687.545	0.041	-0.059	0.145	
7	R7-3-T397	1027917.900	1877855.500	687.4	1027917.921	1877855.502	687.684	0.021	0.002	0.284	
7	R7-3-T398	1027911.200	1877850.700	687.4	1027911.131	1877850.699	687.836	-0.069	-0.001	0.436	
7	R7-3-T399	1028024.800	1877843.400	685.4	1028024.793	1877843.395	685.632	-0.007	-0.005	0.232	

Δ Elevation > 0.5 ft Blue

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Δ Elevation 0.5 to -0.25 ft Green

Δ Elevation/Northing > 0.2 ft Blue

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-T4	1026754.800	1878902.100	688.0	1026754.819	1878902.126	688.299	0.019	0.026	0.299	
7	R7-3-T40	1026975.300	1878830.300	689.2	1026975.360	1878830.332	689.558	0.060	0.032	0.358	
7	R7-3-T400	1027926.300	1877841.900	687.4	1027926.302	1877841.852	687.797	0.002	-0.048	0.397	
7	R7-3-T401	1028020.900	1877836.700	685.4	1028020.848	1877836.671	685.624	-0.052	-0.029	0.224	
7	R7-3-T402	1027941.400	1877835.300	687.6	1027941.384	1877835.310	688.047	-0.016	0.010	0.447	
7	R7-3-T403	1028020.900	1877831.000	685.4	1028020.916	1877831.100	685.469	0.016	0.100	0.069	
7	R7-3-T404	1028024.800	1877817.400	684.9	1028024.865	1877817.405	685.323	0.065	0.005	0.423	
7	R7-3-T405	1027954.700	1877814.400	686.4	1027954.661	1877814.414	686.763	-0.039	0.014	0.363	
7	R7-3-T406	1028030.300	1877810.200	684.9	1028030.283	1877810.110	685.358	-0.017	-0.090	0.458	
7	R7-3-T407	1027959.600	1877804.400	686.4	1027959.571	1877804.412	686.702	-0.029	0.012	0.302	
7	R7-3-T408	1028037.300	1877782.800	683.8	1028037.323	1877782.816	684.149	0.023	0.016	0.349	
7	R7-3-T409	1027966.300	1877782.600	685.8	1027966.303	1877782.526	685.894	0.003	-0.074	0.094	
7	R7-3-T41	1027088.100	1878829.800	687.0	1027088.165	1878829.757	687.137	0.065	-0.043	0.137	
7	R7-3-T410	1028022.100	1877774.700	683.8	1028022.030	1877774.680	684.162	-0.070	-0.020	0.362	
7	R7-3-T411	1027967.000	1877769.000	685.8	1027966.978	1877769.038	686.237	-0.022	0.038	0.437	
7	R7-3-T412	1028013.600	1877755.800	GS	1028013.529	1877755.791	686.554	-0.071	-0.009	NA	
7	R7-3-T413	1028044.900	1877751.700	GS	1028044.940	1877751.665	686.145	0.040	-0.035	NA	
7	R7-3-T414	1027968.700	1877749.300	687.5	1027968.722	1877749.216	687.796	0.022	-0.084	0.296	
7	R7-3-T415	1028028.100	1877749.200	GS	1028028.077	1877749.198	686.240	-0.023	-0.002	NA	
7	R7-3-T416	1028052.600	1877747.200	GS	1028052.597	1877747.160	686.473	-0.003	-0.040	NA	
7	R7-3-T417	1027961.900	1877744.500	687.1	1027961.886	1877744.492	687.357	-0.014	-0.008	0.257	
7	R7-3-T418	1028005.300	1877742.000	GS	1028005.360	1877742.032	687.201	0.060	0.032	NA	
7	R7-3-T419	1028061.800	1877740.600	GS	1028061.790	1877740.564	686.694	-0.010	-0.036	NA	
7	R7-3-T42	1026989.900	1878827.600	687.9	1026989.829	1878827.541	687.785	-0.071	-0.059	-0.115	
7	R7-3-T420	1027991.600	1877740.000	685.9	1027991.636	1877739.927	686.320	0.036	-0.073	0.420	
7	R7-3-T421	1027992.300	1877731.400	686.0	1027992.225	1877731.347	686.276	-0.075	-0.053	0.276	
7	R7-3-T422	1028040.700	1877728.100	GS	1028040.689	1877728.106	686.866	-0.011	0.006	NA	
7	R7-3-T423	1028014.500	1877726.900	GS	1028014.566	1877726.947	687.136	0.066	0.047	NA	
7	R7-3-T424	1027957.900	1877724.500	686.9	1027957.944	1877724.546	687.240	0.044	0.046	0.340	
7	R7-3-T425	1027990.000	1877722.600	686.0	1027989.909	1877722.659	686.280	-0.091	0.059	0.280	
7	R7-3-T426	1028035.500	1877719.800	GS	1028035.524	1877719.743	687.370	0.024	-0.057	NA	
7	R7-3-T427	1028015.200	1877718.400	GS	1028015.272	1877718.350	687.494	0.072	-0.050	NA	
7	R7-3-T428	1027959.800	1877718.200	686.9	1027959.829	1877718.238	687.164	0.029	0.038	0.264	
7	R7-3-T429	1027972.800	1877712.700	686.9	1027972.746	1877712.611	687.049	-0.054	-0.089	0.149	
7	R7-3-T43	1026696.500	1878825.800	687.9	1026696.490	1878825.806	688.119	-0.010	0.006	0.219	
7	R7-3-T430	1027962.800	1877711.700	686.9	1027962.772	1877711.725	687.180	-0.028	0.025	0.280	
7	R7-3-T431	1028023.800	1877708.000	GS	1028023.772	1877708.052	687.935	-0.028	0.052	NA	

Δ Elevation > 0.5 ft Blue

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-T44	1026826.100	1878824.800	686.9	1026826.111	1878824.778	687.298	0.011	-0.022	0.398	
7	R7-3-T45	1026680.600	1878824.200	688.2	1026680.592	1878824.280	688.639	-0.008	0.080	0.439	
7	R7-3-T46	1027115.700	1878814.100	687.4	1027115.804	1878814.113	687.652	0.104	0.013	0.252	
7	R7-3-T47	1026673.800	1878811.400	688.8	1026673.872	1878811.365	688.946	0.072	-0.035	0.146	
7	R7-3-T48	1026813.100	1878803.800	687.5	1026813.029	1878803.761	687.711	-0.071	-0.039	0.211	
7	R7-3-T49	1027151.100	1878803.500	686.5	1027151.135	1878803.515	686.657	0.035	0.015	0.157	
7	R7-3-T5	1026934.400	1878900.500	687.7	1026934.394	1878900.537	688.104	-0.006	0.037	0.404	
7	R7-3-T50	1026663.900	1878796.500	687.4	1026663.821	1878796.521	687.887	-0.079	0.021	0.487	
7	R7-3-T51	1026654.600	1878796.000	689.0	1026654.549	1878795.959	689.338	-0.051	-0.041	0.338	
7	R7-3-T52	1027011.200	1878795.300	689.8	1027011.172	1878795.323	690.112	-0.028	0.023	0.312	
7	R7-3-T53	1026640.400	1878788.200	689.0	1026640.403	1878788.213	689.024	0.003	0.013	0.024	
7	R7-3-T54	1027183.800	1878787.300	687.0	1027183.839	1878787.286	687.467	0.039	-0.014	0.467	
7	R7-3-T55	1027041.200	1878780.300	689.1	1027041.165	1878780.249	689.407	-0.035	-0.051	0.307	
7	R7-3-T56	1026788.700	1878780.200	688.0	1026788.671	1878780.197	688.402	-0.029	-0.003	0.402	
7	R7-3-T57	1026611.500	1878779.300	688.0	1026611.485	1878779.315	688.467	-0.015	0.015	0.467	
7	R7-3-T58	1026800.500	1878778.300	688.0	1026800.455	1878778.231	688.333	-0.045	-0.069	0.333	
7	R7-3-T59	1026627.800	1878777.600	688.6	1026627.766	1878777.665	688.764	-0.034	0.065	0.164	
7	R7-3-T6	1026772.100	1878900.300	688.0	1026772.032	1878900.283	688.356	-0.068	-0.017	0.356	
7	R7-3-T60	1027203.300	1878776.400	687.3	1027203.243	1878776.378	687.398	-0.057	-0.022	0.098	
7	R7-3-T61	1026588.300	1878776.100	687.1	1026588.282	1878776.109	687.547	-0.018	0.009	0.447	
7	R7-3-T62	1026598.700	1878774.900	687.6	1026598.734	1878774.897	688.019	0.034	-0.003	0.419	
7	R7-3-T63	1027069.500	1878770.800	689.7	1027069.505	1878770.806	689.662	0.005	0.006	-0.038	
7	R7-3-T64	1026585.100	1878770.500	687.1	1026585.122	1878770.479	687.463	0.022	-0.021	0.363	
7	R7-3-T65	1026764.800	1878769.300	686.7	1026764.784	1878769.295	687.078	-0.016	-0.005	0.378	
7	R7-3-T66	1027233.300	1878765.800	687.1	1027233.316	1878765.819	687.576	0.016	0.019	0.476	
7	R7-3-T67	1026589.000	1878764.700	687.1	1026589.004	1878764.681	687.488	0.004	-0.019	0.388	
7	R7-3-T68	1027092.900	1878762.900	689.7	1027092.821	1878762.958	690.111	-0.079	0.058	0.411	
7	R7-3-T69	1026756.600	1878755.500	686.7	1026756.619	1878755.478	686.951	0.019	-0.022	0.251	
7	R7-3-T7	1026879.500	1878899.400	688.2	1026879.539	1878899.429	688.571	0.039	0.029	0.371	
7	R7-3-T70	1027248.600	1878755.100	687.1	1027248.538	1878755.037	687.343	-0.062	-0.063	0.243	
7	R7-3-T71	1027121.800	1878754.000	687.7	1027121.858	1878753.975	687.797	0.058	-0.025	0.097	
7	R7-3-T72	1026591.800	1878751.600	685.2	1026591.833	1878751.558	685.465	0.033	-0.042	0.265	
7	R7-3-T73	1027266.900	1878746.900	687.5	1027266.863	1878746.940	687.856	-0.037	0.040	0.356	
7	R7-3-T74	1027147.800	1878741.300	688.0	1027147.749	1878741.339	688.466	-0.051	0.039	0.466	
7	R7-3-T75	1026619.300	1878739.700	685.1	1026619.285	1878739.730	685.206	-0.015	0.030	0.106	
7	R7-3-T76	1026610.400	1878738.900	683.9	1026610.338	1878738.905	683.999	-0.062	0.005	0.099	
7	R7-3-T77	1026742.500	1878735.600	687.6	1026742.554	1878735.650	687.788	0.054	0.050	0.188	

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-T78	1026634.000	1878734.200	685.1	1026634.022	1878734.274	685.377	0.022	0.074	0.277	
7	R7-3-T79	1026596.400	1878734.100	683.8	1026596.431	1878734.104	684.110	0.031	0.004	0.310	
7	R7-3-T8	1026770.400	1878894.900	688.0	1026770.331	1878894.938	688.254	-0.069	0.038	0.254	
7	R7-3-T80	1026608.200	1878733.400	683.8	1026608.159	1878733.424	684.182	-0.041	0.024	0.382	
7	R7-3-T81	1027291.100	1878730.200	687.6	1027291.068	1878730.235	687.915	-0.032	0.035	0.315	
7	R7-3-T82	1026612.700	1878725.900	684.2	1026612.675	1878725.938	684.505	-0.025	0.038	0.305	
7	R7-3-T83	1026745.900	1878725.800	687.8	1026745.873	1878725.712	688.026	-0.027	-0.088	0.226	
7	R7-3-T84	1026599.600	1878725.100	684.9	1026599.539	1878725.057	685.356	-0.061	-0.043	0.456	
7	R7-3-T85	1026630.600	1878722.600	686.2	1026630.616	1878722.622	686.350	0.016	0.022	0.150	
7	R7-3-T86	1027170.300	1878722.300	689.2	1027170.303	1878722.317	689.242	0.003	0.017	0.042	
7	R7-3-T87	1026592.500	1878710.600	683.5	1026592.425	1878710.613	683.898	-0.075	0.013	0.398	
7	R7-3-T88	1027309.500	1878710.200	687.2	1027309.543	1878710.127	687.659	0.043	-0.073	0.459	
7	R7-3-T89	1027273.500	1878705.800	687.0	1027273.434	1878705.779	687.456	-0.066	-0.021	0.456	
7	R7-3-T9	1026973.700	1878893.200	687.1	1026973.774	1878893.209	687.352	0.074	0.009	0.252	
7	R7-3-T90	1027206.100	1878705.200	688.6	1027206.208	1878705.202	688.738	0.108	0.002	0.138	
7	R7-3-T91	1026752.200	1878703.300	685.9	1026752.242	1878703.275	686.059	0.042	-0.025	0.159	
7	R7-3-T92	1027264.200	1878703.100	687.3	1027264.261	1878703.106	687.704	0.061	0.006	0.404	
7	R7-3-T93	1027287.300	1878701.500	687.3	1027287.294	1878701.568	687.639	-0.006	0.068	0.339	
7	R7-3-T94	1026596.600	1878700.600	683.5	1026596.579	1878700.675	683.914	-0.021	0.075	0.414	
7	R7-3-T95	1027269.600	1878698.200	687.3	1027269.584	1878698.203	687.778	-0.016	0.003	0.478	
7	R7-3-T96	1026754.300	1878696.300	685.9	1026754.312	1878696.262	686.350	0.012	-0.038	0.450	
7	R7-3-T97	1027321.000	1878694.900	687.1	1027321.053	1878694.981	687.442	0.053	0.081	0.342	
7	R7-3-T98	1027233.800	1878694.200	688.5	1027233.816	1878694.282	688.829	0.016	0.082	0.329	
7	R7-3-T99	1027263.000	1878690.400	688.1	1027262.968	1878690.425	688.273	-0.032	0.025	0.173	

Δ Elevation > 0.5 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Overburden

Reach 8-1

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
8	R8-1-12868t	1028059.400	1877472.200	687.4	1028059.295	1877472.297	687.912	-0.105	0.097	0.512	All material was taken as targeted material
8	R8-1-12869t	1028051.300	1877472.700	687.9	1028051.320	1877472.733	688.785	0.020	0.033	0.885	All material was taken as targeted material
8	R8-1-12873t	1028050.800	1877465.200	GS	1028050.816	1877465.191	687.513	0.016	-0.009	NA	
8	R8-1-T1	1028051.900	1877476.600	687.9	1028051.906	1877476.654	689.164	0.006	0.054	1.264	All material was taken as targeted material
8	R8-1-T2	1028060.100	1877476.600	687.4	1028060.022	1877476.666	688.602	-0.078	0.066	1.202	All material was taken as targeted material
8	R8-1-T3	1028063.700	1877472.800	687.4	1028063.659	1877472.949	687.786	-0.041	0.149	0.386	
8	R8-1-T4	1028047.700	1877472.400	687.9	1028047.772	1877472.374	688.856	0.072	-0.026	0.956	All material was taken as targeted material
8	R8-1-T5	1028062.000	1877470.400	687.4	1028061.883	1877470.442	687.382	-0.117	0.042	-0.018	
8	R8-1-T6	1028047.400	1877464.700	GS	1028047.453	1877464.750	687.408	0.053	0.050	NA	
8	R8-1-T7	1028054.700	1877464.600	GS	1028054.705	1877464.659	686.912	0.005	0.059	NA	
8	R8-1-T8	1028048.500	1877461.700	GS	1028048.557	1877461.709	686.219	0.057	0.009	NA	
8	R8-1-T9	1028051.300	1877461.000	GS	1028051.273	1877461.027	685.656	-0.027	0.027	NA	

Δ Elevation > 0.5 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation 0.5 to -0.25 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation < -0.25 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS
Bottom of Overburden
Reach 8-2

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
8	R8-2-12848t	1028212.800	1877457.600	688.0	1028212.774	1877457.551	688.874	-0.026	-0.049	0.874	All material was taken as targeted material
8	R8-2-12849t	1028220.100	1877457.800	687.1	1028220.134	1877457.750	689.838	0.034	-0.050	2.738	All material was taken as targeted material
8	R8-2-12858t	1028212.400	1877466.200	687.5	1028212.494	1877466.216	688.994	0.094	0.016	1.494	All material was taken as targeted material
8	R8-2-12861t	1028212.000	1877449.200	686.9	1028211.962	1877449.238	689.407	-0.038	0.038	2.507	All material was taken as targeted material
8	R8-2-T1	1028212.300	1877469.800	687.5	1028212.353	1877469.847	689.205	0.053	0.047	1.705	All material was taken as targeted material
8	R8-2-T10	1028208.700	1877457.300	688.0	1028208.729	1877457.233	687.842	0.029	-0.067	-0.158	
8	R8-2-T11	1028220.000	1877453.800	687.1	1028220.080	1877453.757	690.017	0.080	-0.043	2.917	All material was taken as targeted material
8	R8-2-T12	1028216.300	1877453.700	688.0	1028216.277	1877453.732	689.764	-0.023	0.032	1.764	All material was taken as targeted material
8	R8-2-T13	1028224.000	1877453.700	687.1	1028223.952	1877453.749	690.235	-0.048	0.049	3.135	All material was taken as targeted material
8	R8-2-T14	1028215.900	1877449.500	686.9	1028215.945	1877449.530	689.925	0.045	0.030	3.025	All material was taken as targeted material
8	R8-2-T15	1028208.700	1877449.200	686.9	1028208.739	1877449.276	688.955	0.039	0.076	2.055	All material was taken as targeted material
8	R8-2-T16	1028208.700	1877445.100	686.9	1028208.738	1877445.163	688.847	0.038	0.063	1.947	All material was taken as targeted material
8	R8-2-T17	1028212.000	1877445.100	686.9	1028212.011	1877445.076	689.547	0.011	-0.024	2.647	All material was taken as targeted material
8	R8-2-T18	1028216.000	1877445.100	686.9	1028216.055	1877445.114	689.937	0.055	0.014	3.037	All material was taken as targeted material
8	R8-2-T2	1028208.600	1877469.700	687.5	1028208.592	1877469.698	688.188	-0.008	-0.002	0.688	All material was taken as targeted material
8	R8-2-T3	1028216.100	1877469.700	687.5	1028216.039	1877469.656	689.600	-0.061	-0.044	2.100	All material was taken as targeted material
8	R8-2-T4	1028216.300	1877466.000	687.5	1028216.333	1877466.067	689.515	0.033	0.067	2.015	All material was taken as targeted material
8	R8-2-T5	1028209.100	1877465.700	687.5	1028209.109	1877465.788	688.065	0.009	0.088	0.565	All material was taken as targeted material
8	R8-2-T6	1028220.100	1877461.800	687.1	1028220.061	1877461.774	689.942	-0.039	-0.026	2.842	All material was taken as targeted material
8	R8-2-T7	1028224.100	1877461.800	687.1	1028224.139	1877461.738	690.086	0.039	-0.062	2.986	All material was taken as targeted material
8	R8-2-T8	1028216.500	1877461.700	687.1	1028216.426	1877461.664	689.604	-0.074	-0.036	2.504	All material was taken as targeted material
8	R8-2-T9	1028224.100	1877457.600	687.1	1028224.099	1877457.543	690.164	-0.001	-0.057	3.064	All material was taken as targeted material

△ Elevation > 0.5 ft Blue

△ Easting/Northing < or = 0.2 ft Green

△ Elevation 0.5 to -0.25 ft Green

△ Easting/Northing > 0.2 ft Blue

△ Elevation < -0.25 ft Red



Appendix F

Notification of Successful GPS
Verification Survey for the Bottoms of
Targeted Material, Reach 7 – All
Sections (R7-1 through R7-3) (on
attached CD)

KC 205

Mr. Glen Anderson
Tronox LLC
800 Weyrauch Street
West Chicago, Illinois 60185

JW 1-3-11

ARCADIS
800 Weyrauch Street
West Chicago
Illinois 60185
Tel 630.293.7695
Fax 630.293.7719
www.arcadis-us.com

Environmental

Subject:

**Notification of Successful GPS Verification Survey
For the Bottom of Targeted Material - Reach 7**
Kress Creek/West Branch of the DuPage River Remedial Action Project
DuPage County, Illinois

Date:
January 3, 2011

Dear Glen:

In accordance with Section 2.1.5.2 – Notification in the *Reach 7 Final Design/Remedial Action Work Plan* (FD/RA Work Plan) for the above-referenced project, ARCADIS U.S., Inc. (ARCADIS) is pleased to notify Tronox LLC, the United States Environmental Protection Agency (USEPA) RPM/OSC, the Illinois Emergency Management Agency (IEMA) and the Local Communities' Representative (WBK Associates) that a successful Global Positioning System (GPS) Verification Survey was performed for the **Bottom of Targeted Material** for the excavations for the entirety of **Reach 7 (and Excavation Areas R8-1 and R8-2 in Reach 8)** at the Kress Creek/West Branch DuPage River Remedial Action Project located in West Chicago (DuPage County), Illinois at the time and date noted below:

1. This GPS Verification Survey Package issued on January 3, 2011 includes for the entirety of Reach 7 and Excavation Areas R8-1 and R8-2 in Reach 8 the targeted material points achieved and documented in accordance with the Work Plan. These GPS verification points for bottom of targeted material in Reach 7 and Excavation Areas R8-1 and R8-2 in Reach 8 were previously distributed by a series of e-mails entitled "GPS Points Achieved" dated from June 25, 2010 through November 9, 2010.

**Excavation Locations: Reach 7: Sections R7-1 through R7-3, and in
Reach 8 Excavation Areas R8-1 and R8-2.**

Date of Verification: January 3, 2011

Contact:
Michael F. Savage

Cell Phone:
630.235.1423

Email:
Michael.Savage@arcadis-us.com

Our ref:
B0071034.0000

In accordance with Section 2.1.5.1 – Concurrent Verification of the FD/RA Work Plan, ARCADIS sent an e-mail each week with a weekly schedule for the next week that listed the projected locations and dates where excavations and GPS Verification Surveys would be performed. ARCADIS sent those weekly schedule e-mails to Tim Fischer of the USEPA; Gary McCandless, Kelly Grahn, and Steve Shafer of IEMA/DNS; and John Wills and Jamie Geils of WBK Associates providing them the required 24-hour notice that the excavations and GPS Verification Surveys for the bottom of targeted material in the above-listed areas would be completed during those weeks.

The attached Excel file prepared by Carlson PSI includes a separate table entitled *Kress Creek/ West Branch DuPage River Verification Points, Bottom of Targeted Material* for each of the three sections that comprise Reach 7 and for Excavation Areas R8-1 and R8-2 in Reach 8, and the tables list the design, actual, and difference of the survey coordinates and elevations of the verification points in each section.

The attached PDF file prepared by Carlson PSI includes eight separate PDF figures numbered 1 of 8, 2 of 8, etc., and the figures are numbered from north to south. The figures present collectively a map of the excavation locations of the three sections that comprise Reach 7 and Excavation Areas R8-1 and R8-2 in Reach 8, and denote the location of each of the verification points that have been verified.

The verification points listed in these attachments have been achieved and backfilling in the specified excavation locations has proceeded in accordance with the prior preliminary verbal approval of these points based on the field monitoring of the regulators' representatives. Documents pertaining to this survey are available for inspection at the ARCADIS construction office at Tronox's REF Facility.

Sincerely,

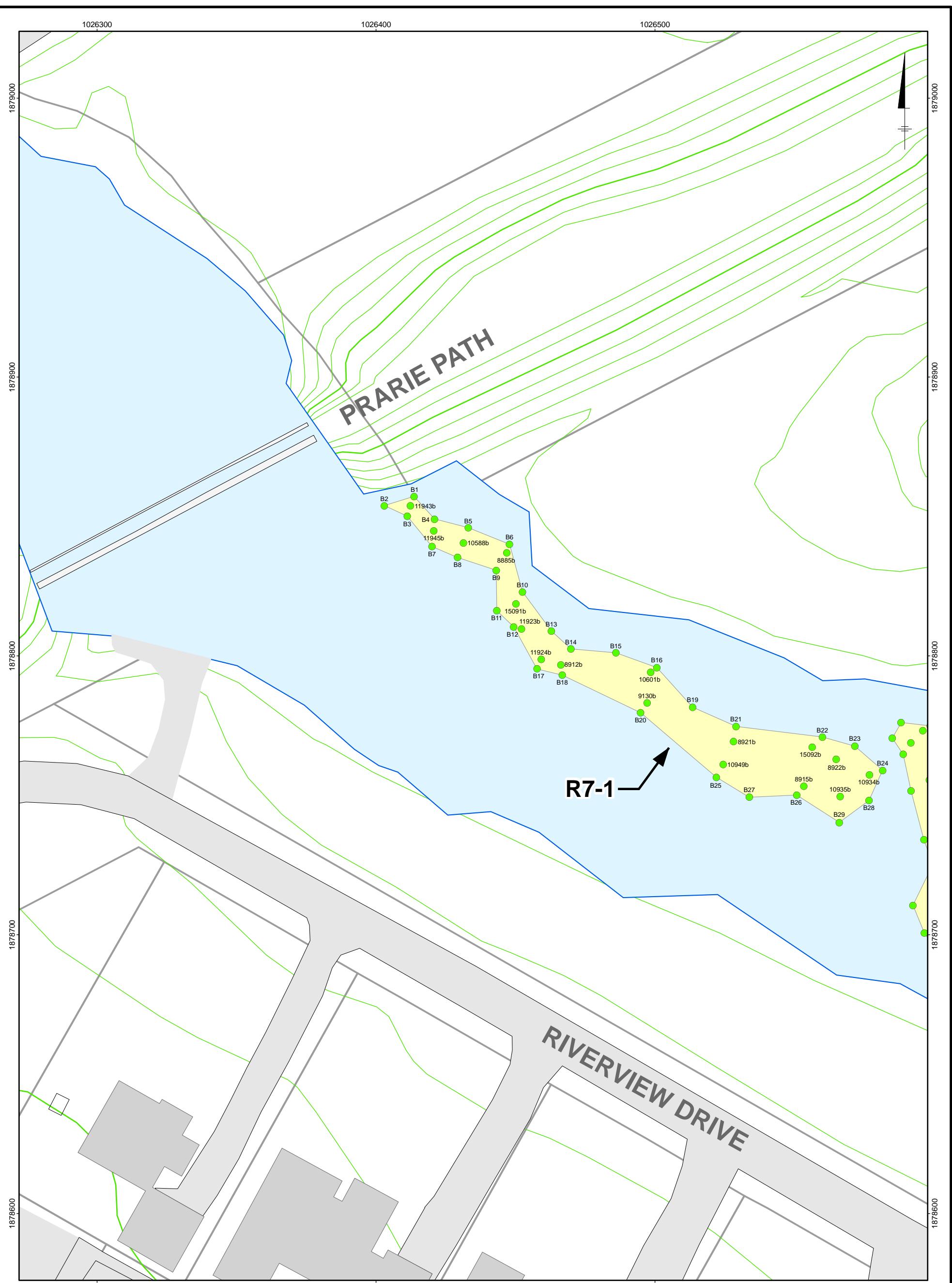
ARCADIS



Michael F. Savage
Principle Civil Engineer

Copies:

Timothy Fischer, United States Environmental Protection Agency
Glen Anderson, Tronox LLC
Jeffery Williams, Tronox LLC
Gary McCandless, IEMA
Kelly Grahn, IEMA
Steve Shafer, REM/IEMA
Jamie Geils, WBK Associates
John Wills, WBK Associates
Michael Crystal, Sevenson
Rick Elia, Jr., Sevenson
Marty Folan, Sevenson
Ricky Moss, Sevenson
Amy Ruta, Sevenson
Wade Carlson, Carlson PSI
Jerry Krane, Carlson PSI
Mark Gravelding, ARCADIS
Joseph Molina, ARCADIS
Elizabeth Razawich, ARCADIS
Heather Vandewalker, ARCADIS
Joseph Kotwicki, ARCADIS



NOTE:

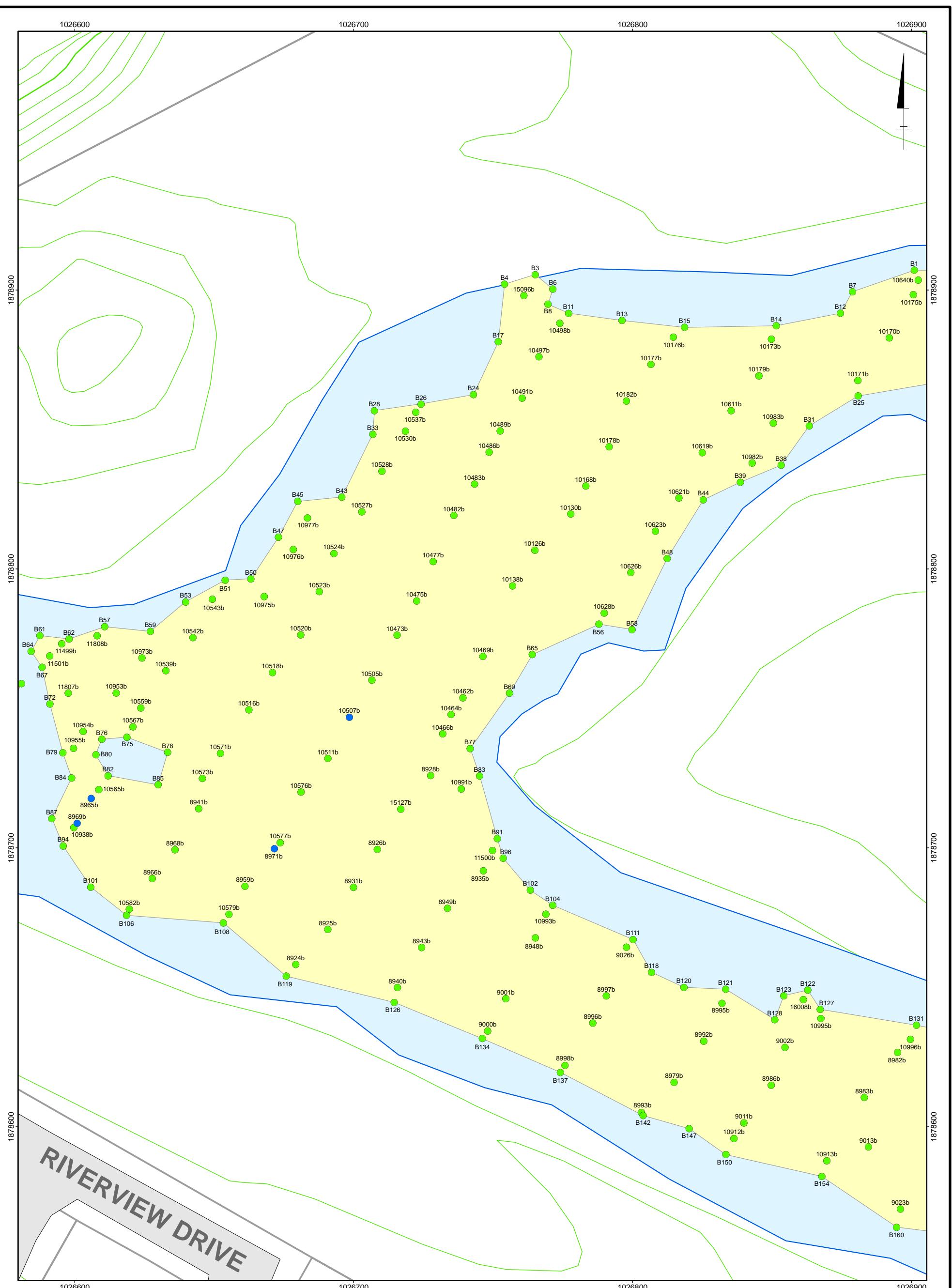
- COORDINATE SYSTEM: ILLINOIS EAST STATE PLANE
DATUM: NAD 83
UNITS: FEET

TRONOX LLC
KRESS CREEK/WEST BRANCH DUPAGE RIVER
REMEDIATION TRACKING SYSTEM

GPS VERIFICATION POINTS
BOTTOM OF TARGETED MATERIAL
REACH 7
(Figures Numbered North to South)

Carlson
PROFESSIONAL SERVICES

FIGURE
1 of 8


LEGEND:

- 10 FOOT TOPOGRAPHIC CONTOUR
- 2 FOOT TOPOGRAPHIC CONTOUR
- PROPERTY LINE

0 25 50 Feet

DATE: 12/28/2010

PREPARED BY: Dan Ryan

SURVEY LOCATION:

- LOCATION NOT SURVEYED

**ELEVATION DIFFERENCE
(ACTUAL VS DESIGN)**

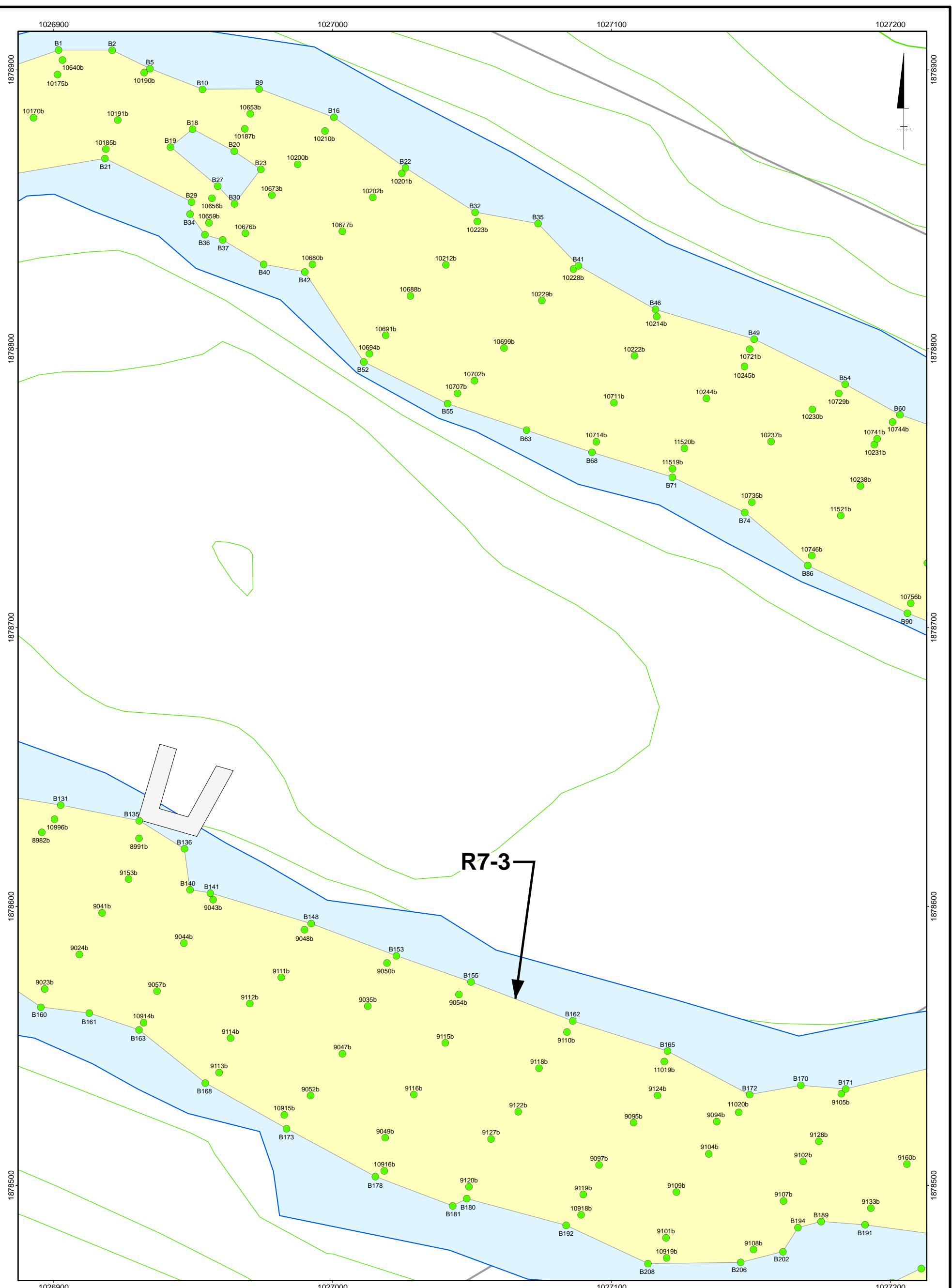
- > 0.00
- ≤ 0.00 to -0.25
- < -0.25

NOTE:
1. COORDINATE SYSTEM: ILLINOIS EAST STATE PLANE
DATUM: NAD 83
UNITS: FEET

TRONOX LLC
KRESS CREEK/WEST BRANCH DUPAGE RIVER
REMEDIATION TRACKING SYSTEM
GPS VERIFICATION POINTS
BOTTOM OF TARGETED MATERIAL
REACH 7
(Figures Numbered North to South)

Carlson
PROFESSIONAL SERVICES

**FIGURE
2 of 8**



DATE: 12/28/2010

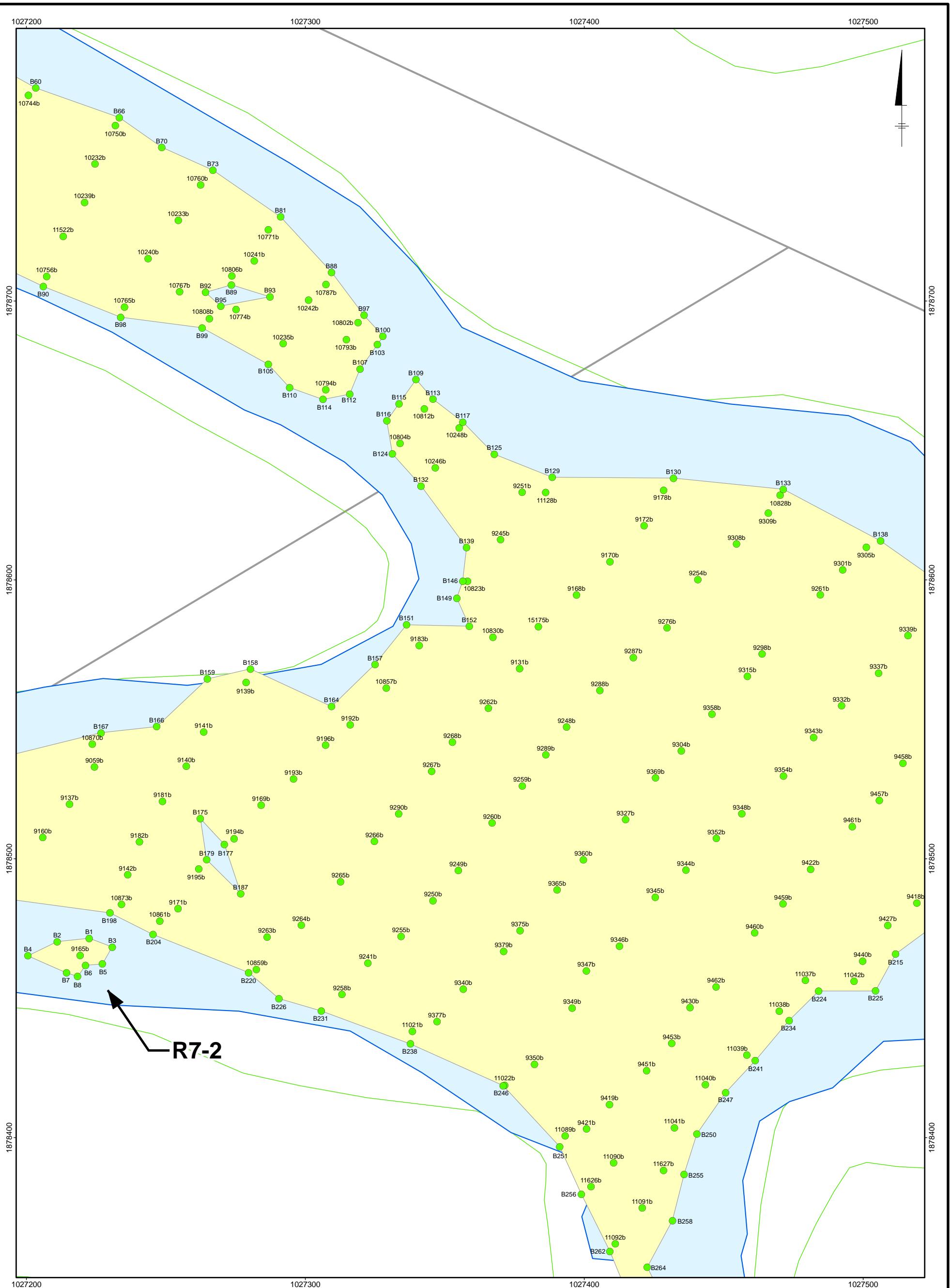
PREPARED BY: Dan Ryan

TRONOX LLC
KRESS CREEK/WEST BRANCH DUPAGE RIVER
REMEDIATION TRACKING SYSTEM

GPS VERIFICATION POINTS
BOTTOM OF TARGETED MATERIAL
REACH 7
(Figures Numbered North to South)

Carlson
PROFESSIONAL SERVICES

FIGURE
3 of 8



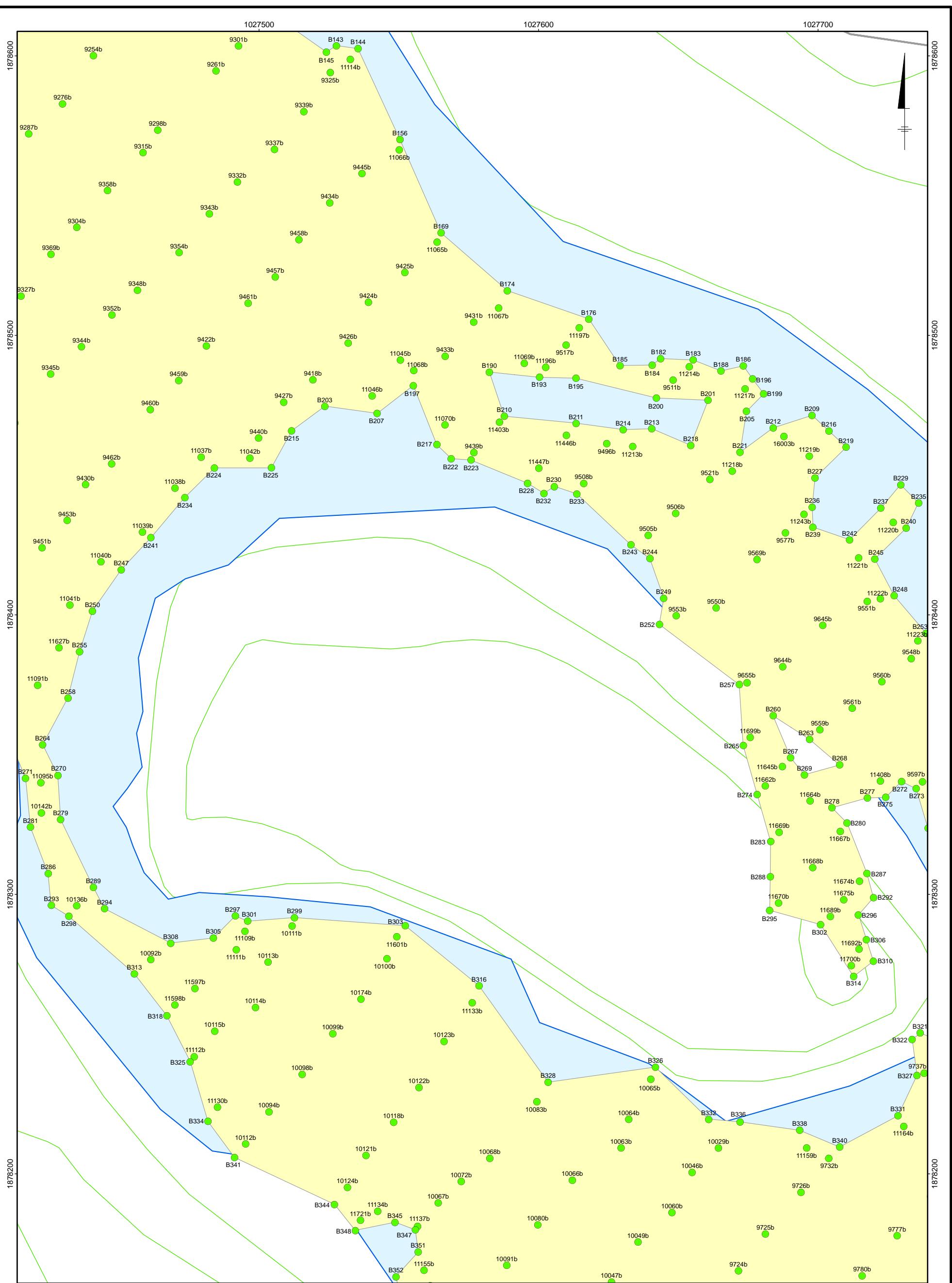
DATE: 12/28/2010

PREPARED BY: Dan Ryan

TRONOX LLC
KRESS CREEK/WEST BRANCH DUPAGE RIVER
REMEDIATION TRACKING SYSTEM
GPS VERIFICATION POINTS
BOTTOM OF TARGETED MATERIAL
REACH 7
(Figures Numbered North to South)



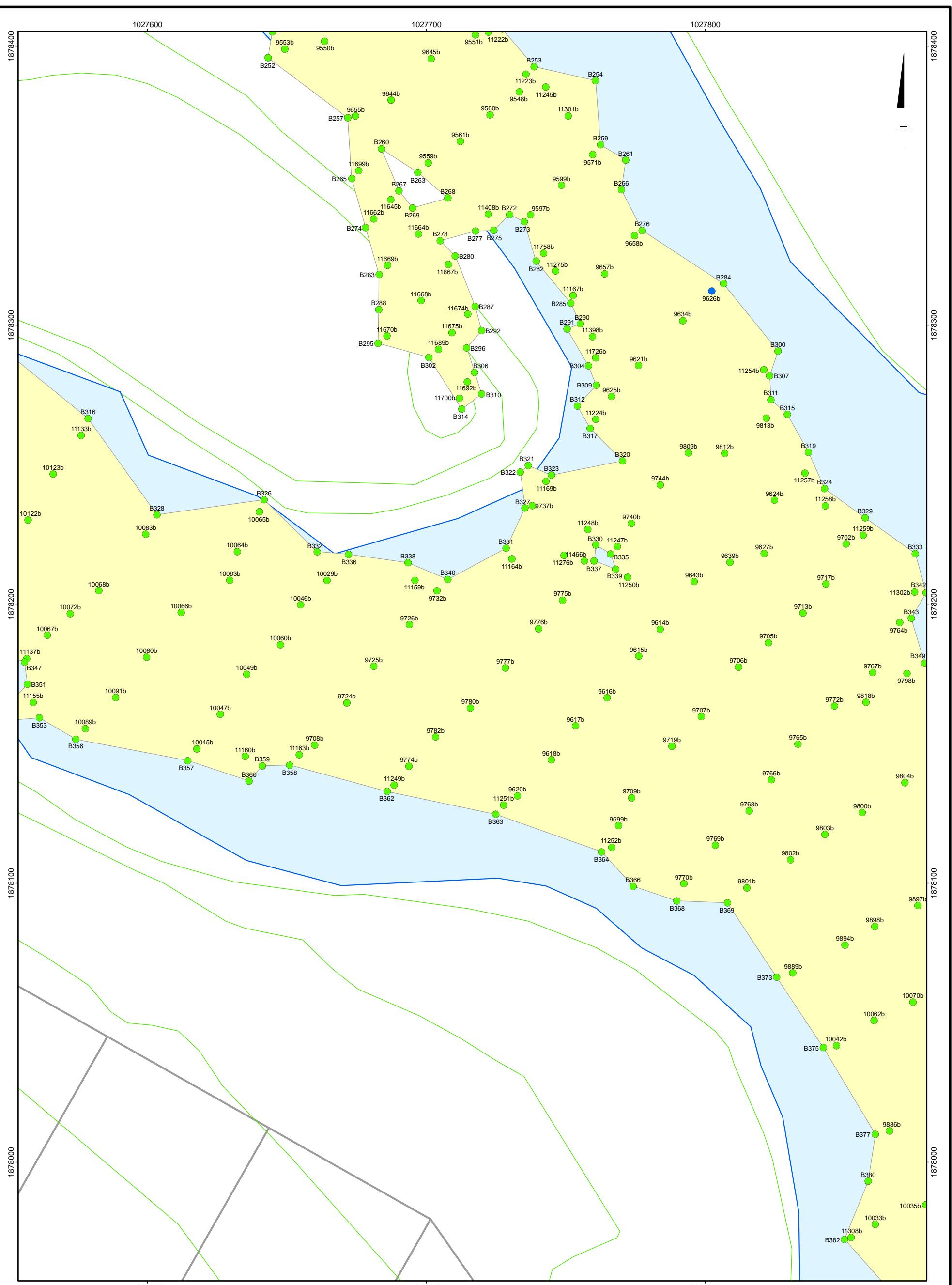
FIGURE
4 of 8



NOTE:
 1. COORDINATE SYSTEM: ILLINOIS EAST STATE PLANE
 DATUM: NAD 83
 UNITS: FEET

TRONOX LLC
KRESS CREEK/WEST BRANCH DUPAGE RIVER
REMEDIATION TRACKING SYSTEM
GPS VERIFICATION POINTS
BOTTOM OF TARGETED MATERIAL
REACH 7
 (Figures Numbered North to South)





DATE: 12/28/2010

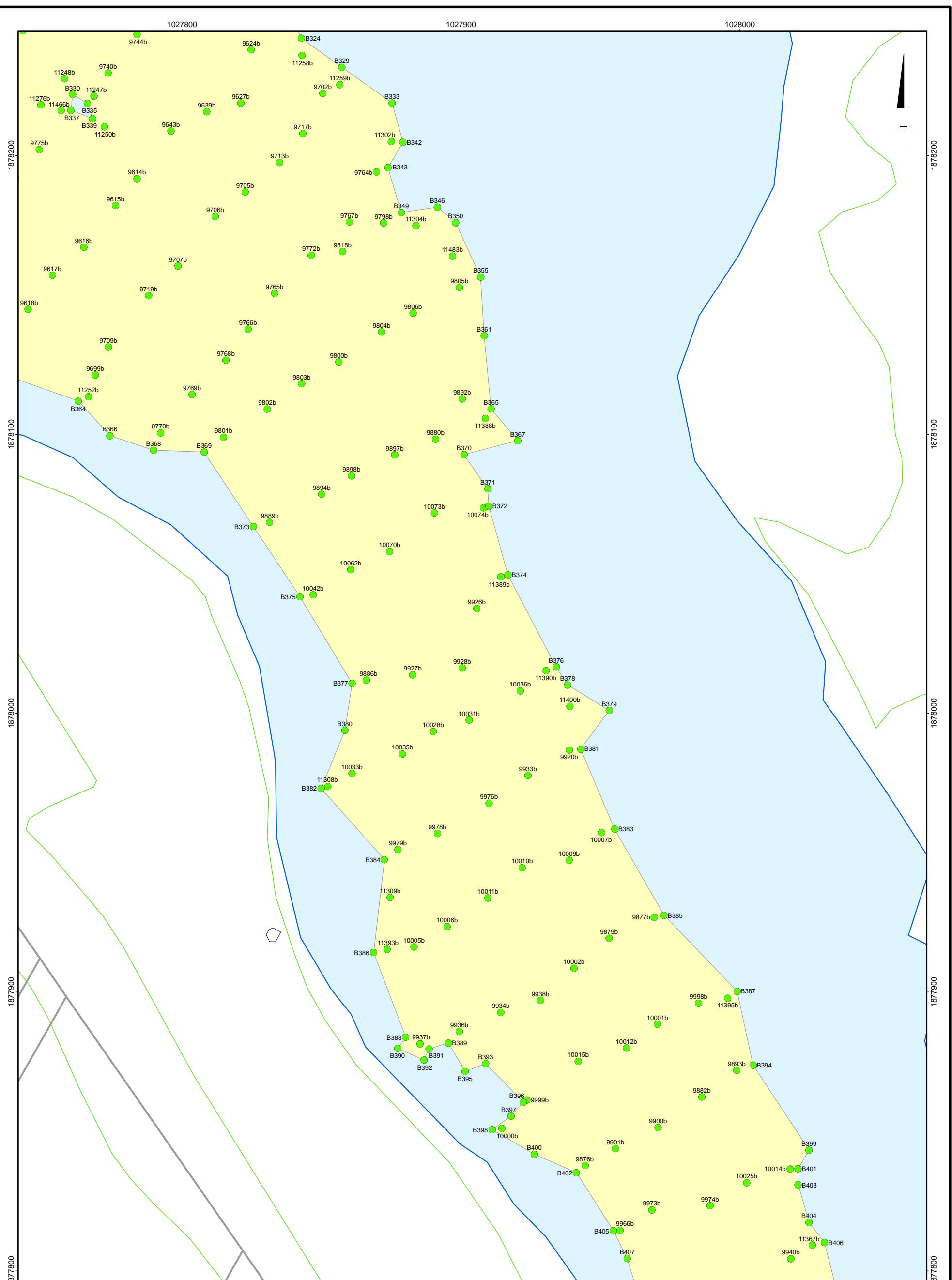
PREPARED BY: Dan Ryan

NOTE:
1. COORDINATE SYSTEM: ILLINOIS EAST STATE PLANE
DATUM: NAD 83
UNITS: FEET

TRONOX LLC
KRESS CREEK/WEST BRANCH DUPAGE RIVER
REMEDIATION TRACKING SYSTEM
GPS VERIFICATION POINTS
BOTTOM OF TARGETED MATERIAL
REACH 7
(Figures Numbered North to South)



FIGURE
6 of 8



DATE: 12/28/2010

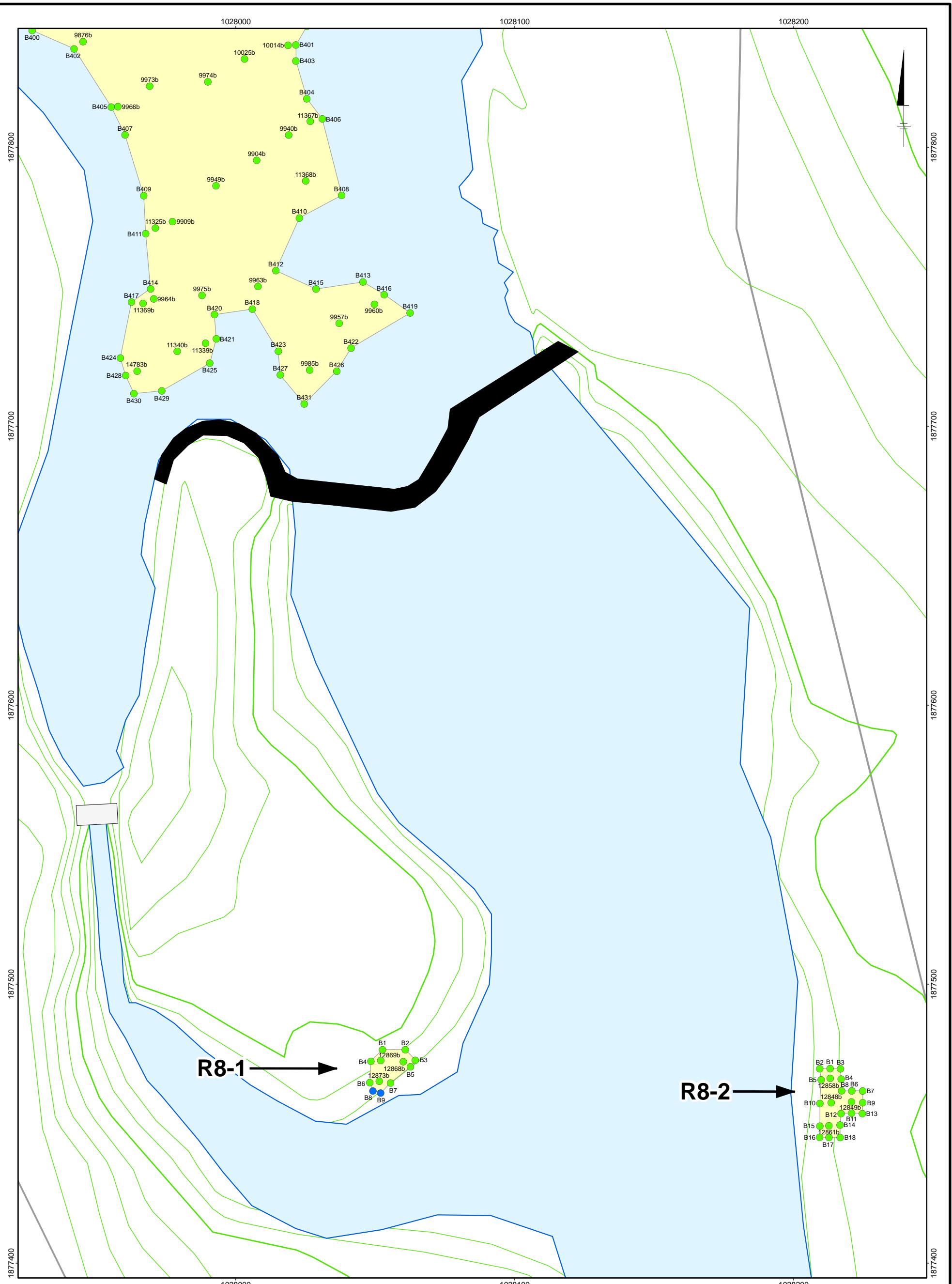
PREPARED BY: Dan Ryan

NOTE:
1. COORDINATE SYSTEM: ILLINOIS EAST STATE PLANE
DATUM: NAD 83
UNITS: FEET

TRONOX LLC
KRESS CREEK/WEST BRANCH DUPAGE RIVER
REMEDIATION TRACKING SYSTEM
GPS VERIFICATION POINTS
BOTTOM OF TARGETED MATERIAL
REACH 7
(Figures Numbered North to South)



FIGURE
7 of 8



LEGEND:

- 10 FOOT TOPOGRAPHIC CONTOUR
— 2 FOOT TOPOGRAPHIC CONTOUR

— PROPERTY LINE

DATE: 12/28/2010

PREPARED BY: Dan Ryan

SURVEY LOCATION:

- LOCATION NOT SURVEYED

ELEVATION DIFFERENCE (ACTUAL VS DESIGN)

- > 0.00
 - $\leq 0.00 \text{ to } -0.25$
 - < -0.25

 < -0.25

TRONOX LLC
KRESS CREEK/WEST BRANCH DUPAGE RIVER
REMEDIATION TRACKING SYSTEM

**GPS VERIFICATION POINTS
BOTTOM OF TARGETED MATERIAL
REACH 7**

REACH 7



KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS
 Bottom of Targeted Material
 Reach 7-1

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-1-10588b	1026431.300	1878840.600	686.7	1026431.325	1878840.500	686.624	.025	-0.100	-0.076	
7	R7-1-10601b	1026498.500	1878794.200	685.9	1026498.469	1878794.156	685.855	-0.031	-0.044	-0.045	
7	R7-1-10934b	1026576.900	1878757.400	684.2	1026576.885	1878757.354	684.184	-0.015	-0.046	-0.016	
7	R7-1-10935b	1026566.400	1878749.600	684.2	1026566.390	1878749.578	684.145	-0.010	-0.022	-0.055	
7	R7-1-10949b	1026524.500	1878761.100	683.2	1026524.474	1878761.084	683.174	-0.026	-0.016	-0.026	
7	R7-1-11923b	1026452.200	1878809.700	684	1026452.138	1878809.671	683.975	-0.062	-0.029	-0.025	
7	R7-1-11924b	1026459.300	1878798.800	684.8	1026459.247	1878798.788	684.778	-0.053	-0.012	-0.022	
7	R7-1-11943b	1026412.300	1878853.800	685.8	1026412.327	1878853.848	685.774	0.027	0.048	-0.026	
7	R7-1-11945b	1026420.700	1878844.800	686	1026420.681	1878844.828	685.995	-0.019	0.028	-0.005	
7	R7-1-15091b	1026450.100	1878818.700	683.6	1026450.161	1878818.675	683.548	0.061	-0.025	-0.052	
7	R7-1-15092b	1026556.300	1878767.300	683.8	1026556.351	1878767.288	683.753	0.051	-0.012	-0.047	
7	R7-1-8885b	1026446.800	1878837.000	688.5	1026446.854	1878836.968	688.492	0.054	-0.032	-0.008	
7	R7-1-8912b	1026466.300	1878796.800	684.1	1026466.272	1878796.788	684.096	-0.028	-0.012	-0.004	
7	R7-1-8915b	1026553.400	1878753.300	684.2	1026553.371	1878753.275	684.060	-0.029	-0.025	-0.140	
7	R7-1-8921b	1026528.100	1878769.300	684.7	1026528.156	1878769.296	684.578	0.056	-0.004	-0.122	
7	R7-1-8922b	1026565.000	1878763.000	683.8	1026564.974	1878762.944	683.742	-0.026	-0.056	-0.058	
7	R7-1-9130b	1026497.100	1878783.100	684.1	1026497.190	1878783.135	684.034	0.090	0.035	-0.066	
7	R7-1-B1	1026413.600	1878857.200	685.8	1026413.645	1878857.159	685.742	0.045	-0.041	-0.058	
7	R7-1-B10	1026452.500	1878823.000	683.6	1026452.490	1878822.893	683.596	-0.010	-0.107	-0.004	
7	R7-1-B11	1026443.300	1878816.200	683.6	1026443.289	1878816.236	683.560	-0.011	0.036	-0.040	
7	R7-1-B12	1026449.400	1878810.400	684	1026449.334	1878810.384	683.984	-0.066	-0.016	-0.016	
7	R7-1-B13	1026462.900	1878808.900	684	1026462.874	1878808.897	683.965	-0.026	-0.003	-0.035	
7	R7-1-B14	1026469.900	1878802.500	684.1	1026469.874	1878802.516	684.092	-0.026	0.016	-0.008	
7	R7-1-B15	1026486.000	1878801.100	685.9	1026485.997	1878801.130	685.787	-0.003	0.030	-0.113	
7	R7-1-B16	1026500.700	1878795.800	685.9	1026500.671	1878795.767	685.814	-0.029	-0.033	-0.086	
7	R7-1-B17	1026457.700	1878795.300	684.8	1026457.731	1878795.393	684.702	0.031	0.093	-0.098	
7	R7-1-B18	1026466.800	1878793.100	684.1	1026466.769	1878793.146	684.080	-0.031	0.046	-0.020	
7	R7-1-B19	1026513.500	1878781.600	684.1	1026513.505	1878781.565	684.000	0.005	-0.035	-0.100	
7	R7-1-B2	1026403.000	1878853.900	685.8	1026402.968	1878853.821	685.599	-0.032	-0.079	-0.201	
7	R7-1-B20	1026494.900	1878779.600	684.1	1026494.826	1878779.638	683.987	-0.074	0.038	-0.113	
7	R7-1-B21	1026529.100	1878774.700	684.7	1026529.072	1878774.661	684.662	-0.028	-0.039	-0.038	
7	R7-1-B22	1026560.100	1878770.900	683.8	1026560.022	1878770.868	683.793	-0.078	-0.032	-0.007	
7	R7-1-B23	1026571.700	1878767.600	683.8	1026571.657	1878767.633	683.761	-0.043	0.033	-0.039	
7	R7-1-B24	1026581.600	1878759.000	684.2	1026581.631	1878758.905	684.132	0.031	-0.095	-0.068	
7	R7-1-B25	1026522.000	1878756.500	683.2	1026521.993	1878756.436	683.180	-0.007	-0.064	-0.020	
7	R7-1-B26	1026550.800	1878750.100	684.2	1026550.834	1878750.082	684.070	0.034	-0.018	-0.130	
7	R7-1-B27	1026533.800	1878749.300	683.2	1026533.846	1878749.368	683.181	0.046	0.068	-0.019	

Δ Elevation < -0.25 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS
 Bottom of Targeted Material
 Reach 7-1

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-1-B28	1026576.700	1878748.100	684.2	1026576.731	1878748.164	684.106	0.031	0.064	-0.094	
7	R7-1-B29	1026566.100	1878740.300	684.2	1026566.074	1878740.220	683.997	-0.026	-0.080	-0.203	
7	R7-1-B3	1026411.200	1878850.100	685.8	1026411.190	1878850.099	685.780	-0.010	-0.001	-0.020	
7	R7-1-B4	1026421.000	1878849.100	686	1026420.955	1878849.099	685.990	-0.045	-0.091	-0.010	
7	R7-1-B5	1026433.000	1878846.000	686.7	1026433.050	1878845.979	686.618	0.050	-0.021	-0.082	
7	R7-1-B6	1026447.900	1878840.000	688.5	1026447.837	1878840.055	688.490	-0.063	0.055	-0.010	
7	R7-1-B7	1026420.100	1878839.200	686	1026420.052	1878839.238	685.942	-0.048	0.038	-0.058	
7	R7-1-B8	1026429.200	1878835.300	686.7	1026429.225	1878835.356	686.483	0.025	0.056	-0.217	
7	R7-1-B9	1026443.100	1878830.700	688.5	1026443.090	1878830.647	688.396	-0.010	-0.053	-0.104	

△ Elevation < -0.25 ft Blue

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△ Elevation -0.25 to 0.0 ft Green

△ Easting/Northing > 0.2 ft Blue

△ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS
Bottom of Targeted Material
Reach 7-2

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-2-9165b	1027219.200	1878465.400	686.6	1027219.247	1878465.342	686.385	0.047	-0.058	-0.215	
7	R7-2-B1	1027222.500	1878471.500	686.6	1027222.472	1878471.432	686.442	-0.028	-0.068	-0.158	
7	R7-2-B2	1027211.000	1878470.300	686.6	1027211.010	1878470.238	686.570	0.010	-0.062	-0.030	
7	R7-2-B3	1027230.700	1878468.400	686.6	1027230.796	1878468.319	686.584	0.096	-0.081	-0.016	
7	R7-2-B4	1027200.500	1878465.200	686.6	1027200.533	1878465.261	686.461	0.033	0.061	-0.139	
7	R7-2-B5	1027227.300	1878462.300	686.6	1027227.212	1878462.344	686.510	-0.088	0.044	-0.090	
7	R7-2-B6	1027221.200	1878461.800	686.6	1027221.198	1878461.780	686.370	-0.002	-0.020	-0.230	
7	R7-2-B7	1027214.400	1878459.100	686.6	1027214.400	1878459.131	686.367	0.000	0.031	-0.233	
7	R7-2-B8	1027218.400	1878457.800	686.6	1027218.304	1878457.833	686.406	-0.096	0.033	-0.194	

△ Elevation < -0.25 ft Blue

△ Elevation/Northing < or = 0.2 ft Green

△ Elevation -0.25 to 0.0 ft Green

△ Elevation/Northing > 0.2 ft Blue

△ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-10000b	1027914.600	1877851.100	686.4	1027914.666	1877851.150	686.169	.066	.050	-.231	
7	R7-3-10001b	1027970.500	1877888.500	682.4	1027970.471	1877888.476	682.231	-.029	-.024	-.169	
7	R7-3-10002b	1027940.600	1877908.500	682.2	1027940.544	1877908.571	682.106	-.056	.071	-.094	
7	R7-3-10005b	1027883.100	1877916.200	683.7	1027883.150	1877916.239	683.661	.050	.039	-.039	
7	R7-3-10006b	1027895.000	1877923.500	683.4	1027895.026	1877923.496	683.223	.026	-.004	-.177	
7	R7-3-10007b	1027950.300	1877957.200	683.2	1027950.359	1877957.245	683.058	.059	.045	-.142	
7	R7-3-10009b	1027938.800	1877947.400	682.8	1027938.778	1877947.352	682.703	-.022	-.048	-.097	
7	R7-3-10010b	1027921.900	1877944.600	683.3	1027921.938	1877944.646	683.222	.038	.046	-.078	
7	R7-3-10011b	1027909.700	1877933.800	683.2	1027909.661	1877933.778	682.979	-.039	-.022	-.221	
7	R7-3-10012b	1027959.300	1877880.000	681.9	1027959.339	1877879.970	681.791	.039	-.030	-.109	
7	R7-3-10014b	1028018.000	1877836.500	684.9	1028018.025	1877836.577	684.754	.025	.077	-.146	
7	R7-3-10015b	1027942.000	1877875.300	682.6	1027942.019	1877875.223	682.440	.019	-.077	-.160	
7	R7-3-10025b	1028002.400	1877831.700	683.3	1028002.423	1877831.663	683.194	.023	-.037	-.106	
7	R7-3-10028b	1027890.100	1877993.400	683.3	1027890.073	1877993.457	683.247	-.027	.057	-.053	
7	R7-3-10029b	1027664.400	1878209.300	686.9	1027664.371	1878209.269	686.815	-.029	-.031	-.085	
7	R7-3-10031b	1027903.000	1877997.600	682.2	1027902.931	1877997.602	682.030	-.069	.002	-.170	
7	R7-3-10033b	1027861.000	1877978.500	683.3	1027860.925	1877978.463	683.121	-.075	-.037	-.179	
7	R7-3-10035b	1027879.000	1877985.500	682.6	1027879.035	1877985.464	682.457	.035	-.036	-.143	
7	R7-3-10036b	1027921.300	1878008.100	682.4	1027921.265	1878008.082	682.279	-.035	-.018	-.121	
7	R7-3-10042b	1027847.000	1878042.500	683.1	1027847.026	1878042.510	683.029	.026	.010	-.071	
7	R7-3-10045b	1027617.800	1878148.800	687	1027617.735	1878148.867	686.840	-.065	.067	-.160	
7	R7-3-10046b	1027654.900	1878200.600	687.2	1027654.941	1878200.525	687.065	.041	-.075	-.135	
7	R7-3-10047b	1027626.100	1878161.300	687	1027626.093	1878161.303	686.752	-.007	.003	-.248	
7	R7-3-10049b	1027635.600	1878175.600	686.6	1027635.597	1878175.634	686.578	-.003	.034	-.022	
7	R7-3-10060b	1027647.700	1878186.200	687.2	1027647.713	1878186.189	687.153	.013	-.011	-.047	
7	R7-3-10062b	1027860.500	1878051.500	684.1	1027860.510	1878051.540	683.860	.010	.040	-.240	
7	R7-3-10063b	1027629.500	1878209.400	687.4	1027629.532	1878209.320	687.193	.032	-.080	-.207	
7	R7-3-10064b	1027632.300	1878219.600	687.3	1027632.248	1878219.555	687.140	-.052	-.045	-.160	
7	R7-3-10065b	1027640.200	1878233.900	688.8	1027640.146	1878233.863	688.598	-.054	-.037	-.202	
7	R7-3-10066b	1027612.000	1878197.700	686.6	1027612.093	1878197.751	686.398	.093	.051	-.202	
7	R7-3-10067b	1027564.100	1878189.600	687	1027564.096	1878189.634	686.938	-.004	.034	-.062	
7	R7-3-10068b	1027582.600	1878205.600	687.2	1027582.570	1878205.589	686.951	-.030	-.011	-.249	
7	R7-3-10070b	1027874.400	1878058.100	682.6	1027874.434	1878058.089	682.492	.034	-.011	-.108	
7	R7-3-10072b	1027572.300	1878197.300	685.8	1027572.333	1878197.318	685.715	.033	.018	-.085	
7	R7-3-10073b	1027890.500	1878071.900	683.3	1027890.511	1878071.902	683.209	.011	.002	-.091	
7	R7-3-10074b	1027908.100	1878073.700	682.9	1027908.073	1878073.731	682.778	-.027	.031	-.122	
7	R7-3-10080b	1027599.800	1878181.700	686.4	1027599.719	1878181.762	686.173	-.081	.062	-.227	

Δ Elevation < -0.25 ft Blue

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Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-10083b	1027599.400	1878225.800	686.8	1027599.381	1878225.824	686.586	-0.019	0.024	-0.214	
7	R7-3-10089b	1027577.700	1878156.200	688	1027577.746	1878156.131	687.911	0.046	-0.069	-0.089	
7	R7-3-10091b	1027588.600	1878167.300	686.5	1027588.611	1878167.311	686.380	0.011	0.011	-0.120	
7	R7-3-10092b	1027461.300	1878276.700	686.7	1027461.248	1878276.691	686.556	-0.052	-0.009	-0.144	
7	R7-3-10094b	1027503.500	1878222.100	686.6	1027503.560	1878222.197	686.517	0.060	0.097	-0.083	
7	R7-3-10098b	1027515.500	1878235.500	685.8	1027515.415	1878235.605	685.733	-0.085	0.105	-0.067	
7	R7-3-10099b	1027526.400	1878250.200	685.6	1027526.383	1878250.166	685.594	-0.017	-0.034	-0.006	
7	R7-3-10100b	1027545.800	1878277.000	687.3	1027545.764	1878277.023	687.148	-0.036	0.023	-0.152	
7	R7-3-10111b	1027511.800	1878288.700	687.8	1027511.831	1878288.714	687.789	0.031	0.014	-0.011	
7	R7-3-10112b	1027495.200	1878210.700	688.8	1027495.179	1878210.731	688.674	-0.021	0.031	-0.126	
7	R7-3-10113b	1027503.200	1878275.800	687.1	1027503.222	1878275.805	686.935	0.022	0.005	-0.165	
7	R7-3-10114b	1027498.700	1878259.600	686.2	1027498.715	1878259.551	686.016	0.015	-0.049	-0.184	
7	R7-3-10115b	1027484.200	1878251.100	685.9	1027484.145	1878251.077	685.799	-0.055	-0.023	-0.101	
7	R7-3-10118b	1027548.100	1878218.500	686.1	1027548.169	1878218.485	685.937	0.069	-0.015	-0.163	
7	R7-3-10121b	1027538.200	1878206.600	686.3	1027538.271	1878206.601	686.292	0.071	0.001	-0.008	
7	R7-3-10122b	1027557.200	1878230.900	686.2	1027557.219	1878230.916	686.023	0.019	0.016	-0.177	
7	R7-3-10123b	1027566.200	1878247.400	687.5	1027566.200	1878247.410	687.270	0.000	0.010	-0.230	
7	R7-3-10124b	1027531.600	1878195.100	687.6	1027531.610	1878195.169	687.517	0.010	0.069	-0.083	
7	R7-3-10126b	1026765.600	1878806.700	683.4	1026765.656	1878806.740	683.371	0.056	0.040	-0.029	
7	R7-3-10130b	1026778.500	1878819.800	684.2	1026778.532	1878819.740	684.055	0.032	-0.060	-0.145	
7	R7-3-10136b	1027434.700	1878296.000	686.7	1027434.751	1878295.989	686.668	0.051	-0.011	-0.032	
7	R7-3-10138b	1026757.700	1878793.900	683.6	1026757.672	1878793.938	683.537	-0.028	0.038	-0.063	
7	R7-3-10142b	1027422.100	1878329.100	687	1027422.123	1878329.171	686.982	0.023	0.071	-0.018	
7	R7-3-10168b	1026784.000	1878829.800	684.7	1026783.948	1878829.767	684.625	-0.052	-0.033	-0.075	
7	R7-3-10170b	1026892.700	1878882.900	684.2	1026892.723	1878882.867	684.097	0.023	-0.033	-0.103	
7	R7-3-10171b	1026881.500	1878867.600	684.4	1026881.476	1878867.602	684.245	-0.024	0.002	-0.155	
7	R7-3-10173b	1026850.500	1878882.400	686.1	1026850.456	1878882.388	685.987	-0.044	-0.012	-0.113	
7	R7-3-10174b	1027536.500	1878262.500	687.4	1027536.460	1878262.541	687.220	-0.040	0.041	-0.180	
7	R7-3-10175b	1026901.300	1878898.300	686.2	1026901.346	1878898.359	685.996	0.046	0.059	-0.204	
7	R7-3-10176b	1026815.300	1878883.100	686.4	1026815.290	1878883.127	686.195	-0.010	0.027	-0.205	
7	R7-3-10177b	1026807.300	1878873.400	684.2	1026807.286	1878873.375	684.037	-0.014	-0.025	-0.163	
7	R7-3-10178b	1026792.300	1878843.900	684.5	1026792.290	1878843.840	684.353	-0.010	-0.060	-0.147	
7	R7-3-10179b	1026846.000	1878869.200	685.5	1026845.993	1878869.226	685.342	-0.007	0.026	-0.158	
7	R7-3-10182b	1026798.400	1878860.200	684.4	1026798.472	1878860.227	684.155	0.072	0.027	-0.245	
7	R7-3-10185b	1026918.600	1878871.600	685.5	1026918.673	1878871.638	685.268	0.073	0.038	-0.232	
7	R7-3-10187b	1026968.500	1878879.000	684.1	1026968.482	1878878.915	683.854	-0.018	-0.085	-0.246	
7	R7-3-10190b	1026932.500	1878899.100	685.2	1026932.426	1878899.062	684.956	-0.074	-0.038	-0.244	

Δ Elevation < -0.25 ft Blue

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-10191b	1026922.900	1878882.100	683.7	1026922.937	1878882.057	683.502	.037	-0.043	-0.198	
7	R7-3-10200b	1026987.500	1878866.200	685.3	1026987.456	1878866.172	685.146	-0.044	-0.028	-0.154	
7	R7-3-10201b	1027024.800	1878863.000	683.6	1027024.771	1878862.949	683.565	-0.029	-0.051	-0.035	
7	R7-3-10202b	1027014.400	1878854.400	683.4	1027014.369	1878854.336	683.362	-0.031	-0.064	-0.038	
7	R7-3-10210b	1026997.300	1878878.100	684.5	1026997.225	1878878.132	684.478	-0.075	0.032	-0.022	
7	R7-3-10212b	1027040.600	1878830.200	683.3	1027040.574	1878830.138	683.222	-0.026	-0.062	-0.078	
7	R7-3-10214b	1027116.200	1878811.600	685.4	1027116.147	1878811.599	685.391	-0.053	-0.001	-0.009	
7	R7-3-10222b	1027108.200	1878797.500	684.8	1027108.181	1878797.532	684.612	-0.019	0.032	-0.188	
7	R7-3-10223b	1027051.900	1878845.700	682.8	1027051.850	1878845.691	682.690	-0.050	-0.009	-0.110	
7	R7-3-10228b	1027086.200	1878828.600	686.5	1027086.313	1878828.642	686.392	0.113	0.042	-0.108	
7	R7-3-10229b	1027074.900	1878817.400	684.4	1027074.990	1878817.331	684.332	0.090	-0.069	-0.068	
7	R7-3-10230b	1027171.900	1878778.300	683.5	1027171.944	1878778.308	683.422	0.044	0.008	-0.078	
7	R7-3-10231b	1027194.200	1878765.800	681.9	1027194.135	1878765.692	681.888	-0.065	-0.108	-0.012	
7	R7-3-10232b	1027224.600	1878749.100	681.3	1027224.585	1878749.164	681.140	-0.015	0.064	-0.160	
7	R7-3-10233b	1027254.500	1878729.000	680.3	1027254.451	1878728.949	680.291	-0.049	-0.051	-0.009	
7	R7-3-10235b	1027292.000	1878684.800	681.7	1027292.063	1878684.771	681.659	0.063	-0.029	-0.041	
7	R7-3-10237b	1027157.200	1878766.800	683.9	1027157.150	1878766.780	683.759	-0.050	-0.020	-0.141	
7	R7-3-10238b	1027189.200	1878750.800	684.9	1027189.181	1878750.881	684.820	-0.019	0.081	-0.080	
7	R7-3-10239b	1027220.800	1878735.300	684.2	1027220.838	1878735.354	684.141	0.038	0.054	-0.059	
7	R7-3-10240b	1027243.600	1878715.200	685.3	1027243.613	1878715.222	685.287	0.013	0.022	-0.013	
7	R7-3-10241b	1027281.700	1878714.400	684.4	1027281.702	1878714.417	684.337	0.002	0.017	-0.063	
7	R7-3-10242b	1027301.100	1878700.300	683.4	1027301.153	1878700.337	683.200	0.053	0.037	-0.200	
7	R7-3-10244b	1027134.000	1878782.300	684.2	1027133.982	1878782.279	684.012	-0.018	-0.021	-0.188	
7	R7-3-10245b	1027147.600	1878793.700	681.3	1027147.631	1878793.692	681.266	0.031	-0.008	-0.034	
7	R7-3-10246b	1027346.500	1878640.200	686.5	1027346.584	1878640.214	686.276	0.084	0.014	-0.224	
7	R7-3-10248b	1027355.200	1878654.500	683.1	1027355.154	1878654.525	682.885	-0.046	0.025	-0.215	
7	R7-3-10462b	1026739.900	1878753.800	685.9	1026739.858	1878753.802	685.672	-0.042	0.002	-0.228	
7	R7-3-10464b	1026735.700	1878747.800	685.1	1026735.651	1878747.821	684.858	-0.049	0.021	-0.242	
7	R7-3-10466b	1026732.600	1878740.900	685.1	1026732.653	1878740.894	685.031	0.053	-0.006	-0.069	
7	R7-3-10469b	1026747.100	1878768.700	684.2	1026747.045	1878768.644	683.986	-0.055	-0.056	-0.214	
7	R7-3-10473b	1026716.200	1878776.200	684.2	1026716.254	1878776.275	684.047	0.054	0.075	-0.153	
7	R7-3-10475b	1026723.300	1878788.500	685.3	1026723.298	1878788.514	685.168	-0.002	0.014	-0.132	
7	R7-3-10477b	1026729.200	1878802.700	684.1	1026729.192	1878802.662	683.971	-0.008	-0.038	-0.129	
7	R7-3-10482b	1026736.600	1878819.100	684	1026736.642	1878819.196	683.864	0.042	0.096	-0.136	
7	R7-3-10483b	1026744.000	1878830.400	684.5	1026744.028	1878830.429	684.262	0.028	0.029	-0.238	
7	R7-3-10486b	1026749.200	1878841.800	684.4	1026749.260	1878841.883	684.266	0.060	0.083	-0.134	
7	R7-3-10489b	1026753.200	1878849.500	684.5	1026753.240	1878849.480	684.273	0.040	-0.020	-0.227	

Δ Elevation < -0.25 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-10491b	1026761.100	1878861.300	683.9	1026761.109	1878861.272	683.808	0.009	-0.028	-0.092	
7	R7-3-10497b	1026767.100	1878876.100	684.9	1026767.143	1878876.105	684.657	0.043	0.005	-0.243	
7	R7-3-10498b	1026774.600	1878888.100	687.5	1026774.602	1878888.082	687.410	0.002	-0.018	-0.090	
7	R7-3-10505b	1026707.300	1878760.100	685.5	1026707.243	1878760.158	685.314	-0.057	0.058	-0.186	
7	R7-3-10507b	1026699.100	1878746.800	684.7	1026699.159	1878746.811	684.147	0.059	0.011	-0.553	Isolated over excavation of Targeted Material
7	R7-3-10511b	1026691.400	1878732.100	684.2	1026691.472	1878732.047	684.100	0.072	-0.053	-0.100	
7	R7-3-10516b	1026663.100	1878749.500	685	1026663.146	1878749.500	684.955	0.046	0.000	-0.045	
7	R7-3-10518b	1026671.600	1878762.900	685.1	1026671.598	1878762.868	684.944	-0.002	-0.032	-0.156	
7	R7-3-10520b	1026681.700	1878776.300	684.1	1026681.735	1878776.352	684.088	0.035	0.052	-0.012	
7	R7-3-10523b	1026688.400	1878791.800	684.4	1026688.377	1878791.882	684.354	-0.023	0.082	-0.046	
7	R7-3-10524b	1026693.600	1878805.600	683.7	1026693.635	1878805.535	683.595	0.035	-0.065	-0.105	
7	R7-3-10527b	1026703.700	1878820.400	683.9	1026703.632	1878820.477	683.660	-0.068	0.077	-0.240	
7	R7-3-10528b	1026710.800	1878835.000	684.4	1026710.834	1878835.056	684.157	0.034	0.056	-0.243	
7	R7-3-10530b	1026719.300	1878849.400	684.7	1026719.262	1878849.378	684.674	-0.038	-0.022	-0.026	
7	R7-3-10537b	1026722.900	1878856.200	687.2	1026722.983	1878856.195	687.190	0.083	-0.005	-0.010	
7	R7-3-10539b	1026633.400	1878763.500	684.6	1026633.363	1878763.509	684.471	-0.037	0.009	-0.129	
7	R7-3-10542b	1026643.100	1878775.400	684.8	1026643.084	1878775.376	684.719	-0.016	-0.024	-0.081	
7	R7-3-10543b	1026650.100	1878789.200	686.5	1026650.050	1878789.158	686.296	-0.050	-0.042	-0.204	
7	R7-3-10559b	1026624.400	1878750.100	684.8	1026624.405	1878750.151	684.764	0.005	0.051	-0.036	
7	R7-3-10565b	1026609.300	1878720.800	683.7	1026609.325	1878720.881	683.660	0.025	0.081	-0.040	
7	R7-3-10567b	1026621.500	1878743.400	684.6	1026621.564	1878743.385	684.507	0.064	-0.015	-0.093	
7	R7-3-10571b	1026652.900	1878733.900	684.5	1026652.937	1878733.878	684.449	0.037	-0.022	-0.051	
7	R7-3-10573b	1026646.400	1878724.900	685.2	1026646.469	1878724.886	684.961	0.069	-0.014	-0.239	
7	R7-3-10576b	1026681.900	1878720.000	684.3	1026681.828	1878720.015	684.103	-0.072	0.015	-0.197	
7	R7-3-10577b	1026674.400	1878701.800	683.8	1026674.362	1878701.852	683.718	-0.038	0.052	-0.082	
7	R7-3-10579b	1026656.100	1878676.200	683.6	1026656.019	1878676.180	683.390	-0.081	-0.020	-0.210	
7	R7-3-10582b	1026620.200	1878678.000	682.8	1026620.283	1878678.038	682.735	0.083	0.038	-0.065	
7	R7-3-10611b	1026836.100	1878856.700	684.5	1026836.031	1878856.757	684.263	-0.069	0.057	-0.237	
7	R7-3-10619b	1026825.700	1878841.600	684.4	1026825.676	1878841.676	684.177	-0.024	0.076	-0.223	
7	R7-3-10621b	1026817.300	1878825.400	684.4	1026817.297	1878825.466	684.176	-0.003	0.066	-0.224	
7	R7-3-10623b	1026808.900	1878813.500	685	1026808.892	1878813.543	684.783	-0.008	0.043	-0.217	
7	R7-3-10626b	1026800.000	1878798.700	685.9	1026800.086	1878798.718	685.727	0.086	0.018	-0.173	
7	R7-3-10628b	1026790.600	1878784.100	687	1026790.523	1878784.189	686.869	-0.077	0.089	-0.131	
7	R7-3-10640b	1026903.100	1878903.600	686.1	1026903.107	1878903.579	685.869	0.007	-0.021	-0.231	
7	R7-3-10653b	1026970.400	1878884.300	683.6	1026970.451	1878884.299	683.580	0.051	-0.001	-0.020	
7	R7-3-10656b	1026956.700	1878854.000	685.7	1026956.722	1878854.004	685.524	0.022	0.004	-0.176	
7	R7-3-10659b	1026955.700	1878845.200	687.3	1026955.633	1878845.214	687.082	-0.067	0.014	-0.218	

Δ Elevation < -0.25 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-10673b	1026978.200	1878855.200	684.8	1026978.184	1878855.144	684.663	-0.016	-0.056	-0.137	
7	R7-3-10676b	1026968.700	1878841.400	686.2	1026968.722	1878841.471	686.132	0.022	0.071	-0.068	
7	R7-3-10677b	1027003.400	1878842.200	684.6	1027003.439	1878842.162	684.406	0.039	-0.038	-0.194	
7	R7-3-10680b	1026992.700	1878830.400	684.9	1026992.747	1878830.311	684.692	0.047	-0.089	-0.208	
7	R7-3-10688b	1027027.900	1878818.900	684.1	1027027.855	1878818.973	683.874	-0.045	0.073	-0.226	
7	R7-3-10691b	1027019.000	1878804.900	686.7	1027019.017	1878804.884	686.583	0.017	-0.016	-0.117	
7	R7-3-10694b	1027013.200	1878798.300	689.3	1027013.165	1878798.278	689.202	-0.035	-0.022	-0.098	
7	R7-3-10699b	1027061.400	1878800.300	684.7	1027061.407	1878800.327	684.560	0.007	0.027	-0.140	
7	R7-3-10702b	1027050.800	1878788.700	686.4	1027050.805	1878788.615	686.184	0.005	-0.085	-0.216	
7	R7-3-10707b	1027044.800	1878784.100	687.6	1027044.746	1878784.053	687.596	-0.054	-0.047	-0.004	
7	R7-3-10711b	1027100.800	1878780.700	684.8	1027100.818	1878780.676	684.760	0.018	-0.024	-0.040	
7	R7-3-10714b	1027094.500	1878766.700	688.2	1027094.479	1878766.706	688.125	-0.021	0.006	-0.075	
7	R7-3-10721b	1027149.500	1878800.000	683.5	1027149.479	1878799.909	683.484	-0.021	-0.091	-0.016	
7	R7-3-10729b	1027181.400	1878784.100	684.5	1027181.433	1878784.051	684.331	0.033	-0.049	-0.169	
7	R7-3-10735b	1027150.300	1878745.000	684	1027150.291	1878745.033	683.987	-0.009	0.033	-0.013	
7	R7-3-10741b	1027195.200	1878767.700	684	1027195.172	1878767.758	683.975	-0.028	0.058	-0.025	
7	R7-3-10744b	1027200.700	1878773.700	683.8	1027200.715	1878773.777	683.704	0.015	0.077	-0.096	
7	R7-3-10746b	1027171.700	1878725.900	687.7	1027171.762	1878725.881	687.698	0.062	-0.019	-0.002	
7	R7-3-10750b	1027231.900	1878763.000	684.6	1027231.885	1878762.941	684.594	-0.015	-0.059	-0.006	
7	R7-3-10756b	1027207.300	1878708.800	688.1	1027207.256	1878708.809	688.089	-0.044	0.009	-0.011	
7	R7-3-10760b	1027262.500	1878741.700	684	1027262.458	1878741.636	683.799	-0.042	-0.064	-0.201	
7	R7-3-10765b	1027235.200	1878697.900	688	1027235.154	1878697.835	687.891	-0.046	-0.065	-0.109	
7	R7-3-10767b	1027254.900	1878703.400	683.3	1027254.916	1878703.343	683.124	0.016	-0.057	-0.176	
7	R7-3-10771b	1027286.700	1878725.600	683.6	1027286.704	1878725.576	683.409	0.004	-0.024	-0.191	
7	R7-3-10774b	1027275.100	1878697.000	683.3	1027275.147	1878696.984	683.155	0.047	-0.016	-0.145	
7	R7-3-10787b	1027307.400	1878706.000	683.2	1027307.374	1878705.951	683.197	-0.026	-0.049	-0.003	
7	R7-3-10793b	1027314.800	1878686.200	682.4	1027314.714	1878686.183	682.390	-0.086	-0.017	-0.010	
7	R7-3-10794b	1027307.300	1878668.200	686.7	1027307.311	1878668.219	686.625	0.011	0.019	-0.075	
7	R7-3-10802b	1027318.900	1878692.200	683.6	1027318.874	1878692.267	683.578	-0.026	0.067	-0.022	
7	R7-3-10804b	1027333.900	1878649.000	686.8	1027333.952	1878648.975	686.627	0.052	-0.025	-0.173	
7	R7-3-10806b	1027273.600	1878709.000	682.5	1027273.640	1878709.023	682.431	0.040	0.023	-0.069	
7	R7-3-10808b	1027265.600	1878693.700	685.6	1027265.577	1878693.675	685.533	-0.023	-0.025	-0.067	
7	R7-3-10812b	1027342.600	1878661.300	683.4	1027342.644	1878661.327	683.275	0.044	0.027	-0.125	
7	R7-3-10823b	1027358.200	1878599.600	687.1	1027358.164	1878599.542	686.857	-0.036	-0.058	-0.243	
7	R7-3-10828b	1027470.300	1878630.400	685.1	1027470.224	1878630.397	684.969	-0.076	-0.003	-0.131	
7	R7-3-10830b	1027367.200	1878579.400	683.6	1027367.239	1878579.447	683.514	0.039	0.047	-0.086	
7	R7-3-10857b	1027329.100	1878561.300	687.2	1027329.008	1878561.238	686.999	-0.092	-0.062	-0.201	

Δ Elevation < -0.25 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-10859b	1027282.500	1878460.400	684.2	1027282.413	1878460.311	683.987	-0.087	-0.089	-0.213	
7	R7-3-10861b	1027247.800	1878477.700	682.7	1027247.809	1878477.688	682.683	0.009	-0.012	-0.017	
7	R7-3-10870b	1027223.700	1878541.100	686.3	1027223.633	1878541.153	686.124	-0.067	0.053	-0.176	
7	R7-3-10873b	1027234.100	1878483.700	683.7	1027234.100	1878483.677	683.544	0.000	-0.023	-0.156	
7	R7-3-10912b	1026837.000	1878595.800	685	1026837.051	1878595.782	684.756	0.051	-0.018	-0.244	
7	R7-3-10913b	1026870.400	1878587.800	683.3	1026870.341	1878587.796	683.233	-0.059	-0.004	-0.067	
7	R7-3-10914b	1026932.300	1878558.400	683.8	1026932.228	1878558.411	683.763	-0.072	0.011	-0.037	
7	R7-3-10915b	1026982.700	1878525.400	685.8	1026982.658	1878525.369	685.767	-0.042	-0.031	-0.033	
7	R7-3-10916b	1027018.500	1878505.300	685.1	1027018.495	1878505.255	684.981	-0.005	-0.045	-0.119	
7	R7-3-10918b	1027089.000	1878489.500	685.4	1027089.040	1878489.482	685.194	0.040	-0.018	-0.206	
7	R7-3-10919b	1027119.700	1878474.100	686.8	1027119.709	1878474.059	686.567	0.009	-0.041	-0.233	
7	R7-3-10938b	1026600.300	1878707.300	683	1026600.375	1878707.282	682.836	0.075	-0.018	-0.164	
7	R7-3-10953b	1026615.600	1878755.600	682.9	1026615.554	1878755.540	682.750	-0.046	-0.060	-0.150	
7	R7-3-10954b	1026603.700	1878741.700	683.4	1026603.708	1878741.770	683.382	0.008	0.070	-0.018	
7	R7-3-10955b	1026600.300	1878735.800	683.3	1026600.281	1878735.704	683.178	-0.019	-0.096	-0.122	
7	R7-3-10973b	1026624.800	1878768.100	686.1	1026624.796	1878768.102	685.886	-0.004	0.002	-0.214	
7	R7-3-10975b	1026668.700	1878790.200	682.9	1026668.633	1878790.140	682.862	-0.067	-0.060	-0.038	
7	R7-3-10976b	1026679.100	1878807.000	684.3	1026679.067	1878806.987	684.233	-0.033	-0.013	-0.067	
7	R7-3-10977b	1026684.100	1878818.300	684.7	1026684.130	1878818.302	684.456	0.030	0.002	-0.244	
7	R7-3-10982b	1026843.600	1878838.000	688	1026843.586	1878837.977	687.901	-0.014	-0.023	-0.099	
7	R7-3-10983b	1026851.100	1878852.300	685.1	1026851.140	1878852.301	684.875	0.040	0.001	-0.225	
7	R7-3-10991b	1026739.300	1878721.200	685.8	1026739.275	1878721.129	685.760	-0.025	-0.071	-0.040	
7	R7-3-10993b	1026769.700	1878676.200	682	1026769.590	1878676.216	681.867	-0.110	0.016	-0.133	
7	R7-3-10995b	1026868.200	1878638.800	683.8	1026868.219	1878638.835	683.561	0.019	0.035	-0.239	
7	R7-3-10996b	1026900.300	1878631.400	686.1	1026900.290	1878631.362	685.958	-0.010	-0.038	-0.142	
7	R7-3-11019b	1027118.900	1878544.500	682.7	1027118.884	1878544.492	682.663	-0.016	-0.008	-0.037	
7	R7-3-11020b	1027145.600	1878526.300	683.2	1027145.560	1878526.277	683.094	-0.040	-0.023	-0.106	
7	R7-3-11021b	1027338.400	1878438.200	686.5	1027338.395	1878438.134	686.391	-0.005	-0.066	-0.109	
7	R7-3-11022b	1027371.600	1878418.800	687.7	1027371.501	1878418.759	687.477	-0.099	-0.041	-0.223	
7	R7-3-11037b	1027479.300	1878456.500	683.1	1027479.300	1878456.439	682.993	0.000	-0.061	-0.107	
7	R7-3-11038b	1027470.000	1878445.300	685.1	1027469.917	1878445.366	684.858	-0.083	0.066	-0.242	
7	R7-3-11039b	1027458.300	1878429.700	684.1	1027458.283	1878429.648	683.860	-0.017	-0.052	-0.240	
7	R7-3-11040b	1027443.400	1878419.000	687.2	1027443.429	1878419.041	687.145	0.029	0.041	-0.055	
7	R7-3-11041b	1027432.300	1878403.600	686.4	1027432.329	1878403.553	686.259	0.029	-0.047	-0.141	
7	R7-3-11042b	1027496.700	1878456.100	684.3	1027496.726	1878456.106	684.170	0.026	0.006	-0.130	
7	R7-3-11045b	1027550.600	1878491.300	683.5	1027550.576	1878491.223	683.254	-0.024	-0.077	-0.246	
7	R7-3-11046b	1027540.500	1878478.400	683.5	1027540.446	1878478.390	683.261	-0.054	-0.010	-0.239	

Δ Elevation < -0.25 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS
Bottom of Targeted Material
Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-11065b	1027563.700	1878533.300	683.9	1027563.709	1878533.398	683.690	0.009	0.098	-0.210	
7	R7-3-11066b	1027550.200	1878566.400	686.3	1027550.151	1878566.411	686.082	-0.049	0.011	-0.218	
7	R7-3-11067b	1027585.800	1878509.800	683.2	1027585.737	1878509.809	683.121	-0.063	0.009	-0.079	
7	R7-3-11068b	1027555.400	1878487.500	684.3	1027555.375	1878487.471	684.213	-0.025	-0.029	-0.087	
7	R7-3-11069b	1027594.900	1878490.000	681.8	1027594.904	1878490.051	681.559	0.004	0.051	-0.241	
7	R7-3-11070b	1027566.600	1878468.000	683.5	1027566.517	1878468.024	683.356	-0.083	0.024	-0.144	
7	R7-3-11089b	1027393.200	1878400.700	688.7	1027393.149	1878400.658	688.457	-0.051	-0.042	-0.243	
7	R7-3-11090b	1027410.500	1878391.000	686.5	1027410.511	1878391.013	686.406	0.011	0.013	-0.094	
7	R7-3-11091b	1027420.800	1878374.800	686.4	1027420.792	1878374.835	686.269	-0.008	0.035	-0.131	
7	R7-3-11092b	1027411.200	1878362.000	687.2	1027411.125	1878361.979	687.074	-0.075	-0.021	-0.126	
7	R7-3-11095b	1027422.000	1878340.000	687.5	1027421.936	1878339.968	687.427	-0.064	-0.032	-0.073	
7	R7-3-11109b	1027494.900	1878286.800	687.4	1027494.969	1878286.806	687.211	0.069	0.006	-0.189	
7	R7-3-11111b	1027491.900	1878280.200	686.5	1027491.869	1878280.222	686.477	-0.031	0.022	-0.023	
7	R7-3-11112b	1027476.900	1878241.900	686.4	1027476.804	1878241.891	686.193	-0.096	-0.009	-0.207	
7	R7-3-11114b	1027532.600	1878598.700	686.4	1027532.649	1878598.777	686.281	0.049	0.077	-0.119	
7	R7-3-11128b	1027386.200	1878631.400	683.4	1027386.150	1878631.362	683.365	-0.050	-0.038	-0.035	
7	R7-3-11130b	1027485.000	1878223.900	687.1	1027485.114	1878223.861	686.868	0.114	-0.039	-0.232	
7	R7-3-11133b	1027576.300	1878261.200	687.5	1027576.244	1878261.238	687.292	-0.056	0.038	-0.208	
7	R7-3-11134b	1027542.500	1878186.700	687	1027542.451	1878186.647	686.998	-0.049	-0.053	-0.002	
7	R7-3-11137b	1027556.800	1878181.300	687	1027556.711	1878181.232	686.925	-0.089	-0.068	-0.075	
7	R7-3-11155b	1027559.100	1878165.500	687.9	1027559.031	1878165.533	687.672	-0.069	0.033	-0.228	
7	R7-3-11159b	1027696.000	1878209.400	687.5	1027695.922	1878209.311	687.273	-0.078	-0.089	-0.227	
7	R7-3-11160b	1027635.100	1878146.200	687	1027635.028	1878146.196	686.901	-0.072	-0.004	-0.099	
7	R7-3-11163b	1027654.500	1878146.800	686.8	1027654.436	1878146.794	686.697	-0.064	-0.006	-0.103	
7	R7-3-11164b	1027730.700	1878217.000	688.6	1027730.677	1878216.994	688.562	-0.023	-0.006	-0.038	
7	R7-3-11167b	1027752.600	1878311.300	683.2	1027752.604	1878311.360	682.959	0.004	0.060	-0.241	
7	R7-3-11169b	1027742.900	1878244.800	685.9	1027742.882	1878244.842	685.821	-0.018	0.042	-0.079	
7	R7-3-11196b	1027602.600	1878488.600	682.9	1027602.560	1878488.611	682.805	-0.040	0.011	-0.095	
7	R7-3-11197b	1027614.500	1878502.700	683.6	1027614.545	1878502.735	683.383	0.045	0.035	-0.217	
7	R7-3-11213b	1027633.600	1878460.300	683.1	1027633.683	1878460.288	682.853	0.083	-0.012	-0.247	
7	R7-3-11214b	1027653.900	1878488.700	681.6	1027653.939	1878488.799	681.590	0.039	0.099	-0.010	
7	R7-3-11217b	1027673.900	1878480.800	681.3	1027673.907	1878480.885	681.122	0.007	0.085	-0.178	
7	R7-3-11218b	1027669.300	1878451.500	683.1	1027669.279	1878451.462	683.084	-0.021	-0.038	-0.016	
7	R7-3-11219b	1027696.900	1878456.900	682.2	1027696.862	1878456.814	681.959	-0.038	-0.086	-0.241	
7	R7-3-11220b	1027726.900	1878433.100	681	1027726.908	1878433.112	680.890	0.008	0.012	-0.110	
7	R7-3-11221b	1027714.600	1878420.400	682.6	1027714.540	1878420.408	682.377	-0.060	0.008	-0.223	
7	R7-3-11222b	1027722.200	1878405.800	683.6	1027722.289	1878405.801	683.599	0.089	0.001	-0.001	

Δ Elevation < -0.25 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-11223b	1027735.600	1878390.800	683	1027735.695	1878390.746	682.963	0.095	-0.054	-0.037	
7	R7-3-11224b	1027760.700	1878267.000	686.9	1027760.746	1878267.047	686.839	0.046	0.047	-0.061	
7	R7-3-11243b	1027695.000	1878436.000	682.5	1027694.974	1878436.001	682.488	-0.026	0.001	-0.012	
7	R7-3-11245b	1027742.800	1878386.200	682.8	1027742.808	1878386.126	682.713	0.008	-0.074	-0.087	
7	R7-3-11247b	1027768.400	1878221.400	686	1027768.443	1878221.386	685.841	0.043	-0.014	-0.159	
7	R7-3-11248b	1027757.800	1878227.600	687.3	1027757.877	1878227.572	687.163	0.077	-0.028	-0.137	
7	R7-3-11249b	1027688.500	1878135.900	686.2	1027688.447	1878135.905	685.980	-0.053	0.005	-0.220	
7	R7-3-11250b	1027772.100	1878210.400	685.2	1027772.181	1878210.393	685.117	0.081	-0.007	-0.083	
7	R7-3-11251b	1027727.700	1878128.700	686.7	1027727.713	1878128.734	686.568	0.013	0.034	-0.132	
7	R7-3-11252b	1027766.500	1878113.600	686.4	1027766.508	1878113.602	686.212	0.008	0.002	-0.188	
7	R7-3-11254b	1027821.000	1878284.800	682	1027820.964	1878284.772	681.920	-0.036	-0.028	-0.080	
7	R7-3-11257b	1027835.600	1878247.700	682	1027835.694	1878247.692	681.911	0.094	-0.008	-0.089	
7	R7-3-11258b	1027843.100	1878236.000	682.4	1027843.028	1878236.001	682.251	-0.072	0.001	-0.149	
7	R7-3-11259b	1027856.600	1878225.400	682.6	1027856.578	1878225.456	682.373	-0.022	0.056	-0.227	
7	R7-3-11275b	1027746.300	1878320.200	686.8	1027746.322	1878320.209	686.573	0.022	0.009	-0.227	
7	R7-3-11276b	1027749.400	1878218.200	687.5	1027749.385	1878218.267	687.342	-0.015	0.067	-0.158	
7	R7-3-11301b	1027750.800	1878375.800	682.4	1027750.842	1878375.783	682.176	0.042	-0.017	-0.224	
7	R7-3-11302b	1027875.100	1878205.100	684.2	1027875.027	1878205.105	684.031	-0.073	0.005	-0.169	
7	R7-3-11304b	1027883.800	1878175.000	684	1027883.865	1878174.914	683.937	0.065	-0.086	-0.063	
7	R7-3-11308b	1027852.300	1877973.700	687.7	1027852.265	1877973.737	687.465	-0.035	0.037	-0.235	
7	R7-3-11309b	1027874.600	1877934.000	683.8	1027874.637	1877933.949	683.748	0.037	-0.051	-0.052	
7	R7-3-11325b	1027970.500	1877771.000	685.3	1027970.475	1877771.064	685.117	-0.025	0.064	-0.183	
7	R7-3-11339b	1027988.500	1877729.700	684.5	1027988.463	1877729.767	684.366	-0.037	0.067	-0.134	
7	R7-3-11340b	1027978.400	1877726.900	682.9	1027978.311	1877726.860	682.662	-0.089	-0.040	-0.238	
7	R7-3-11367b	1028025.900	1877809.300	683.4	1028025.981	1877809.329	683.162	0.081	0.029	-0.238	
7	R7-3-11368b	1028024.300	1877788.000	681.3	1028024.368	1877787.955	681.217	0.068	-0.045	-0.083	
7	R7-3-11369b	1027966.100	1877744.100	686.1	1027966.075	1877744.074	685.931	-0.025	-0.026	-0.169	
7	R7-3-11388b	1027908.700	1878105.700	685	1027908.724	1878105.771	684.943	0.024	0.071	-0.057	
7	R7-3-11389b	1027914.300	1878049.000	683.6	1027914.309	1878048.955	683.403	0.009	-0.045	-0.197	
7	R7-3-11390b	1027930.500	1878015.300	683	1027930.543	1878015.322	682.868	0.043	0.022	-0.132	
7	R7-3-11393b	1027873.500	1877915.400	684.4	1027873.490	1877915.403	684.183	-0.010	0.003	-0.217	
7	R7-3-11395b	1027995.600	1877897.800	683.5	1027995.633	1877897.846	683.261	0.033	0.046	-0.239	
7	R7-3-11398b	1027759.600	1878296.600	684.3	1027759.572	1878296.638	684.100	-0.028	0.038	-0.200	
7	R7-3-11400b	1027939.000	1878002.600	683.6	1027939.033	1878002.529	683.501	0.033	-0.071	-0.099	
7	R7-3-11403b	1027586.000	1878468.900	683.4	1027586.033	1878468.964	683.277	0.033	0.064	-0.123	
7	R7-3-11408b	1027722.300	1878340.500	686.6	1027722.287	1878340.564	686.498	-0.013	0.064	-0.102	
7	R7-3-11446b	1027610.000	1878464.300	683.3	1027609.944	1878464.262	683.239	-0.056	-0.038	-0.061	

Δ Elevation < -0.25 ft Blue

Δ Elevation/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Elevation/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-11447b	1027600.100	1878452.600	683.9	1027600.092	1878452.516	683.829	-0.008	-0.084	-0.071	
7	R7-3-11466b	1027756.700	1878216.300	687.2	1027756.676	1878216.270	687.034	-0.024	-0.030	-0.166	
7	R7-3-11483b	1027897.000	1878164.000	683.7	1027896.973	1878163.993	683.682	-0.027	-0.007	-0.018	
7	R7-3-11499b	1026596.000	1878773.100	687.1	1026596.029	1878773.193	687.077	0.029	0.093	-0.023	
7	R7-3-11500b	1026750.400	1878699.100	684.9	1026750.461	1878699.052	684.849	0.061	-0.048	-0.051	
7	R7-3-11501b	1026591.800	1878768.800	686.6	1026591.728	1878768.837	686.580	-0.072	0.037	-0.020	
7	R7-3-11519b	1027121.800	1878757.000	685.2	1027121.816	1878757.004	685.145	0.016	0.004	-0.055	
7	R7-3-11520b	1027126.200	1878764.300	682.7	1027126.087	1878764.352	682.582	-0.113	0.052	-0.118	
7	R7-3-11521b	1027182.100	1878740.200	682.5	1027182.167	1878740.245	682.398	0.067	0.045	-0.102	
7	R7-3-11522b	1027213.100	1878723.200	683.1	1027213.196	1878723.191	682.919	0.096	-0.009	-0.181	
7	R7-3-11597b	1027477.000	1878266.300	686.7	1027477.046	1878266.338	686.544	0.046	0.038	-0.156	
7	R7-3-11598b	1027469.800	1878260.400	686.4	1027469.886	1878260.468	686.322	0.086	0.068	-0.078	
7	R7-3-11601b	1027549.400	1878284.900	687.2	1027549.309	1878284.867	686.973	-0.091	-0.033	-0.227	
7	R7-3-11626b	1027402.400	1878382.500	687.1	1027402.425	1878382.462	686.857	0.025	-0.038	-0.243	
7	R7-3-11627b	1027428.400	1878388.300	686.7	1027428.435	1878388.268	686.513	0.035	-0.032	-0.187	
7	R7-3-11645b	1027687.200	1878345.700	686.9	1027687.238	1878345.738	686.661	0.038	0.038	-0.239	
7	R7-3-11662b	1027681.200	1878338.800	687.4	1027681.137	1878338.855	687.342	-0.063	0.055	-0.058	
7	R7-3-11664b	1027697.100	1878333.500	688.1	1027697.163	1878333.471	687.934	0.063	-0.029	-0.166	
7	R7-3-11667b	1027707.900	1878322.500	686.9	1027707.955	1878322.547	686.854	0.055	0.047	-0.046	
7	R7-3-11668b	1027698.000	1878309.600	686.8	1027698.095	1878309.608	686.702	0.095	0.008	-0.098	
7	R7-3-11669b	1027686.000	1878322.200	685.9	1027686.057	1878322.230	685.668	0.057	0.030	-0.232	
7	R7-3-11670b	1027685.900	1878297.000	691.7	1027685.869	1878296.936	691.502	-0.031	-0.064	-0.198	
7	R7-3-11674b	1027714.900	1878304.800	686.5	1027714.835	1878304.738	686.391	-0.065	-0.062	-0.109	
7	R7-3-11675b	1027709.200	1878298.200	686.4	1027709.184	1878298.114	686.189	-0.016	-0.086	-0.211	
7	R7-3-11689b	1027704.300	1878292.100	686.5	1027704.382	1878292.117	686.274	0.082	0.017	-0.226	
7	R7-3-11692b	1027714.700	1878280.500	687.1	1027714.663	1878280.436	686.883	-0.037	-0.064	-0.217	
7	R7-3-11699b	1027675.700	1878356.100	688.6	1027675.737	1878356.160	688.439	0.037	0.060	-0.161	
7	R7-3-11700b	1027711.800	1878274.500	688	1027711.891	1878274.555	687.858	0.091	0.055	-0.142	
7	R7-3-11721b	1027536.300	1878183.500	688	1027536.293	1878183.439	687.997	-0.007	-0.061	-0.003	
7	R7-3-11726b	1027760.700	1878289.100	687	1027760.727	1878289.057	686.759	0.027	-0.043	-0.241	
7	R7-3-11758b	1027742.100	1878326.500	686.2	1027742.052	1878326.583	686.137	-0.048	0.083	-0.063	
7	R7-3-11807b	1026598.400	1878755.500	682.7	1026598.366	1878755.495	682.699	-0.034	-0.005	-0.001	
7	R7-3-11808b	1026608.700	1878776.000	687.5	1026608.746	1878776.066	687.355	0.046	0.066	-0.145	
7	R7-3-14783b	1027963.900	1877719.800	683.9	1027963.925	1877719.785	683.689	0.025	-0.015	-0.211	
7	R7-3-15096b	1026761.800	1878898.000	687.5	1026761.737	1878898.030	687.288	-0.063	0.030	-0.212	
7	R7-3-15127b	1026717.600	1878713.900	683.2	1026717.612	1878713.904	683.054	0.012	0.004	-0.146	
7	R7-3-15175b	1027383.600	1878583.200	683.8	1027383.560	1878583.228	683.738	-0.040	0.028	-0.062	

Δ Elevation < -0.25 ft Blue

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Δ Easting/Northing > 0.2 ft Blue

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-16003b	1027687.800	1878463.900	684.5	1027687.810	1878463.886	684.452	.010	-0.014	-0.048	
7	R7-3-16008b	1026861.900	1878645.500	686.7	1026861.898	1878645.598	686.454	-0.002	0.098	-0.246	
7	R7-3-8924b	1026679.900	1878658.200	685.9	1026679.930	1878658.175	685.753	.030	-0.025	-0.147	
7	R7-3-8925b	1026691.400	1878670.700	683.5	1026691.424	1878670.746	683.409	.024	0.046	-0.091	
7	R7-3-8926b	1026709.200	1878699.500	683.2	1026709.172	1878699.468	683.154	-0.028	-0.032	-0.046	
7	R7-3-8928b	1026728.200	1878725.900	683.7	1026728.288	1878725.928	683.571	.088	0.028	-0.129	
7	R7-3-8931b	1026700.700	1878685.800	684.8	1026700.635	1878685.830	684.594	-0.065	0.030	-0.206	
7	R7-3-8935b	1026747.200	1878691.800	684.5	1026747.212	1878691.777	684.442	.012	-0.023	-0.058	
7	R7-3-8940b	1026716.400	1878649.900	685	1026716.389	1878649.910	684.978	-0.011	0.010	-0.022	
7	R7-3-8941b	1026645.100	1878714.100	684.5	1026645.152	1878714.068	684.492	.052	-0.032	-0.008	
7	R7-3-8943b	1026725.100	1878664.200	683.3	1026725.061	1878664.271	683.177	-0.039	0.071	-0.123	
7	R7-3-8948b	1026765.800	1878667.700	682.5	1026765.854	1878667.726	682.436	.054	0.026	-0.064	
7	R7-3-8949b	1026734.300	1878678.300	684.4	1026734.330	1878678.329	684.301	.030	0.029	-0.099	
7	R7-3-8959b	1026661.800	1878686.200	683.6	1026661.737	1878686.239	683.531	-0.063	0.039	-0.069	
7	R7-3-8965b	1026606.600	1878717.800	683.9	1026606.612	1878717.710	683.634	.012	-0.090	-0.266	Isolated over excavation of Targeted Material
7	R7-3-8966b	1026628.500	1878689.000	683.1	1026628.508	1878689.009	682.898	.008	0.009	-0.202	
7	R7-3-8968b	1026636.700	1878699.300	683.6	1026636.676	1878699.317	683.486	-0.024	0.017	-0.114	
7	R7-3-8969b	1026601.600	1878708.800	683.4	1026601.581	1878708.832	683.070	-0.019	0.032	-0.330	Isolated over excavation of Targeted Material
7	R7-3-8971b	1026672.300	1878699.700	684.4	1026672.273	1878699.707	683.605	-0.027	0.007	-0.795	Isolated over excavation of Targeted Material
7	R7-3-8979b	1026815.600	1878615.900	683.3	1026815.560	1878615.909	683.146	-0.040	0.009	-0.154	
7	R7-3-8982b	1026895.700	1878626.700	684.5	1026895.701	1878626.668	684.383	.001	-0.032	-0.117	
7	R7-3-8983b	1026883.800	1878610.500	683.3	1026883.775	1878610.480	683.054	-0.025	-0.020	-0.246	
7	R7-3-8986b	1026850.400	1878614.900	684.2	1026850.420	1878614.883	684.014	.020	-0.017	-0.186	
7	R7-3-8991b	1026930.500	1878624.400	686.6	1026930.532	1878624.483	686.360	.032	0.083	-0.240	
7	R7-3-8992b	1026826.200	1878630.700	683.3	1026826.189	1878630.702	683.257	-0.011	0.002	-0.043	
7	R7-3-8993b	1026803.900	1878605.100	686	1026803.872	1878605.095	685.974	-0.028	-0.005	-0.026	
7	R7-3-8995b	1026832.700	1878644.200	683	1026832.748	1878644.245	682.865	.048	0.045	-0.135	
7	R7-3-8996b	1026786.400	1878637.200	683.2	1026786.430	1878637.187	683.132	.030	-0.013	-0.068	
7	R7-3-8997b	1026791.300	1878646.900	683.2	1026791.259	1878646.915	683.067	-0.041	0.015	-0.133	
7	R7-3-8998b	1026776.500	1878622.000	685.9	1026776.468	1878621.996	685.662	-0.032	-0.004	-0.238	
7	R7-3-9000b	1026748.700	1878634.300	685.4	1026748.736	1878634.321	685.161	0.036	0.021	-0.239	
7	R7-3-9001b	1026755.200	1878645.900	682.6	1026755.231	1878645.933	682.474	.031	0.033	-0.126	
7	R7-3-9002b	1026855.400	1878628.400	682.7	1026855.352	1878628.468	682.490	-0.048	0.068	-0.210	
7	R7-3-9011b	1026840.600	1878601.400	683.3	1026840.592	1878601.357	683.279	-0.008	-0.043	-0.021	
7	R7-3-9013b	1026885.200	1878592.800	684.3	1026885.238	1878592.781	684.096	.038	-0.019	-0.204	
7	R7-3-9023b	1026896.800	1878570.500	686.1	1026896.741	1878570.503	685.853	-0.059	0.003	-0.247	
7	R7-3-9024b	1026909.200	1878582.900	684.5	1026909.181	1878582.879	684.251	-0.019	-0.021	-0.249	

Δ Elevation < -0.25 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS
Bottom of Targeted Material
Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-9026b	1026798.500	1878664.400	684.1	1026798.506	1878664.374	683.873	.006	-0.026	-0.227	
7	R7-3-9035b	1027012.600	1878564.400	682.8	1027012.598	1878564.346	682.776	-0.002	-0.054	-0.024	
7	R7-3-9041b	1026917.400	1878597.700	684	1026917.329	1878597.765	683.957	-0.071	0.065	-0.043	
7	R7-3-9043b	1026957.100	1878602.400	684.9	1026957.099	1878602.497	684.848	-0.001	0.097	-0.052	
7	R7-3-9044b	1026946.600	1878587.000	684.1	1026946.660	1878586.935	683.920	.060	-0.065	-0.180	
7	R7-3-9047b	1027003.500	1878547.200	683.4	1027003.485	1878547.249	683.323	-0.015	0.049	-0.077	
7	R7-3-9048b	1026989.900	1878591.700	685.3	1026989.894	1878591.745	685.087	-0.006	0.045	-0.213	
7	R7-3-9049b	1027018.800	1878517.200	685.4	1027018.828	1878517.170	685.279	.028	-0.030	-0.121	
7	R7-3-9050b	1027019.500	1878579.800	684.5	1027019.459	1878579.809	684.496	-0.041	0.009	-0.004	
7	R7-3-9052b	1026992.100	1878532.300	683.5	1026992.052	1878532.278	683.366	-0.048	-0.022	-0.134	
7	R7-3-9054b	1027045.300	1878568.500	683.1	1027045.236	1878568.533	683.063	-0.064	0.033	-0.037	
7	R7-3-9057b	1026937.000	1878569.700	684	1026937.016	1878569.747	683.994	.016	0.047	-0.006	
7	R7-3-9059b	1027224.400	1878533.000	683.4	1027224.378	1878532.926	683.265	-0.022	-0.074	-0.135	
7	R7-3-9094b	1027137.700	1878522.900	684	1027137.673	1878522.918	683.764	-0.027	0.018	-0.236	
7	R7-3-9095b	1027107.800	1878522.600	683.8	1027107.837	1878522.571	683.677	.037	-0.029	-0.123	
7	R7-3-9097b	1027095.400	1878507.400	684.7	1027095.474	1878507.410	684.455	.074	0.010	-0.245	
7	R7-3-9101b	1027119.500	1878481.200	686.6	1027119.473	1878481.262	686.363	-0.027	0.062	-0.237	
7	R7-3-9102b	1027168.700	1878508.700	683	1027168.655	1878508.669	682.948	-0.045	-0.031	-0.052	
7	R7-3-9104b	1027134.800	1878511.300	683.5	1027134.823	1878511.340	683.414	.023	0.040	-0.086	
7	R7-3-9105b	1027182.400	1878532.900	685.2	1027182.363	1878532.945	684.992	-0.037	0.045	-0.208	
7	R7-3-9107b	1027161.600	1878494.400	683.9	1027161.607	1878494.475	683.745	.007	0.075	-0.155	
7	R7-3-9108b	1027150.800	1878477.000	686.1	1027150.853	1878477.072	685.860	.053	0.072	-0.240	
7	R7-3-9109b	1027123.200	1878497.700	684.3	1027123.223	1878497.662	684.237	.023	-0.038	-0.063	
7	R7-3-9110b	1027084.000	1878555.000	685.2	1027083.999	1878555.051	684.990	-0.001	0.051	-0.210	
7	R7-3-9111b	1026981.500	1878574.700	683.4	1026981.539	1878574.645	683.264	.039	-0.055	-0.136	
7	R7-3-9112b	1026970.300	1878565.300	684.4	1026970.289	1878565.239	684.180	-0.011	-0.061	-0.220	
7	R7-3-9113b	1026959.300	1878540.500	685.3	1026959.265	1878540.506	685.135	-0.035	0.006	-0.165	
7	R7-3-9114b	1026963.400	1878552.800	683.9	1026963.366	1878552.891	683.898	-0.034	0.091	-0.002	
7	R7-3-9115b	1027040.300	1878551.200	684	1027040.355	1878551.169	683.804	.055	-0.031	-0.196	
7	R7-3-9116b	1027029.000	1878532.600	684.4	1027029.088	1878532.632	684.196	.088	0.032	-0.204	
7	R7-3-9118b	1027074.000	1878542.100	683.9	1027073.968	1878542.073	683.721	-0.032	-0.027	-0.179	
7	R7-3-9119b	1027089.800	1878496.800	684.2	1027089.821	1878496.794	684.004	.021	-0.006	-0.196	
7	R7-3-9120b	1027048.900	1878499.600	686.3	1027048.843	1878499.573	686.058	-0.057	-0.027	-0.242	
7	R7-3-9122b	1027066.500	1878526.500	684.8	1027066.526	1878526.471	684.756	.026	-0.029	-0.044	
7	R7-3-9124b	1027116.500	1878532.300	683.8	1027116.466	1878532.286	683.565	-0.034	-0.014	-0.235	
7	R7-3-9127b	1027056.800	1878516.700	683.8	1027056.795	1878516.700	683.566	-0.005	0.000	-0.234	
7	R7-3-9128b	1027174.300	1878515.900	682.2	1027174.276	1878515.849	682.156	-0.024	-0.051	-0.044	

Δ Elevation < -0.25 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-9131b	1027376.900	1878568.300	685	1027376.835	1878568.215	684.767	-0.065	-0.085	-0.233	
7	R7-3-9133b	1027193.000	1878491.900	685	1027192.929	1878491.901	684.756	-0.071	0.001	-0.244	
7	R7-3-9137b	1027215.500	1878519.600	683.1	1027215.461	1878519.597	682.876	-0.039	-0.003	-0.224	
7	R7-3-9139b	1027278.800	1878563.200	688.4	1027278.751	1878563.234	688.237	-0.049	0.034	-0.163	
7	R7-3-9140b	1027257.300	1878533.200	683.9	1027257.331	1878533.192	683.809	0.031	-0.008	-0.091	
7	R7-3-9141b	1027263.600	1878545.500	686.7	1027263.551	1878545.464	686.474	-0.049	-0.036	-0.226	
7	R7-3-9142b	1027236.300	1878494.300	683.8	1027236.312	1878494.296	683.614	0.012	-0.004	-0.186	
7	R7-3-9153b	1026926.800	1878609.900	683.5	1026926.799	1878609.888	683.300	-0.001	-0.012	-0.200	
7	R7-3-9160b	1027205.900	1878507.700	683.2	1027205.843	1878507.688	683.015	-0.057	-0.012	-0.185	
7	R7-3-9168b	1027397.200	1878594.600	684.4	1027397.230	1878594.596	684.349	0.030	-0.004	-0.051	
7	R7-3-9169b	1027284.200	1878519.300	683.5	1027284.158	1878519.251	683.409	-0.042	-0.049	-0.091	
7	R7-3-9170b	1027409.200	1878606.500	683.4	1027409.231	1878606.499	683.334	0.031	-0.001	-0.066	
7	R7-3-9171b	1027254.400	1878482.200	683.8	1027254.342	1878482.157	683.587	-0.058	-0.043	-0.213	
7	R7-3-9172b	1027421.500	1878619.400	684.5	1027421.465	1878619.443	684.411	-0.035	0.043	-0.089	
7	R7-3-9178b	1027428.500	1878632.100	685	1027428.461	1878632.151	684.764	-0.039	0.051	-0.236	
7	R7-3-9181b	1027248.800	1878520.600	683.8	1027248.800	1878520.623	683.562	0.000	0.023	-0.238	
7	R7-3-9182b	1027240.500	1878506.200	683.7	1027240.534	1878506.116	683.664	0.034	-0.084	-0.036	
7	R7-3-9183b	1027340.800	1878576.500	687.5	1027340.816	1878576.489	687.394	0.016	-0.011	-0.106	
7	R7-3-9192b	1027316.100	1878548.100	683.4	1027316.091	1878548.052	683.265	-0.009	-0.048	-0.135	
7	R7-3-9193b	1027295.700	1878528.700	683.7	1027295.755	1878528.634	683.661	0.055	-0.066	-0.039	
7	R7-3-9194b	1027274.500	1878507.200	683.7	1027274.449	1878507.214	683.572	-0.051	0.014	-0.128	
7	R7-3-9195b	1027261.800	1878496.400	684.9	1027261.802	1878496.381	684.666	0.002	-0.019	-0.234	
7	R7-3-9196b	1027307.300	1878540.700	684.1	1027307.267	1878540.759	684.019	-0.033	0.059	-0.081	
7	R7-3-9241b	1027322.500	1878462.600	683.4	1027322.431	1878462.618	683.295	-0.069	0.018	-0.105	
7	R7-3-9245b	1027369.900	1878614.500	684.7	1027369.972	1878614.487	684.487	0.072	-0.013	-0.213	
7	R7-3-9248b	1027393.700	1878547.300	683.1	1027393.653	1878547.278	683.096	-0.047	-0.022	-0.004	
7	R7-3-9249b	1027354.900	1878495.800	684.4	1027354.865	1878495.838	684.197	-0.035	0.038	-0.203	
7	R7-3-9250b	1027345.800	1878485.000	683.1	1027345.745	1878484.969	683.029	-0.055	-0.031	-0.071	
7	R7-3-9251b	1027377.700	1878631.400	683	1027377.721	1878631.448	682.824	0.021	0.048	-0.176	
7	R7-3-9254b	1027440.700	1878600.100	683.2	1027440.733	1878600.105	683.191	0.033	0.005	-0.009	
7	R7-3-9255b	1027334.400	1878472.200	683.5	1027334.331	1878472.160	683.415	-0.069	-0.040	-0.085	
7	R7-3-9258b	1027313.100	1878451.400	685.2	1027313.130	1878451.407	685.027	0.030	0.007	-0.173	
7	R7-3-9259b	1027377.800	1878526.100	684	1027377.775	1878526.108	683.794	-0.025	0.008	-0.206	
7	R7-3-9260b	1027366.900	1878512.800	683.7	1027366.944	1878512.863	683.677	0.044	0.063	-0.023	
7	R7-3-9261b	1027484.600	1878594.600	684.8	1027484.607	1878594.672	684.750	0.007	0.072	-0.050	
7	R7-3-9262b	1027365.600	1878554.100	683.4	1027365.627	1878554.013	683.303	0.027	-0.087	-0.097	
7	R7-3-9263b	1027286.300	1878471.900	682.8	1027286.295	1878471.935	682.647	-0.005	0.035	-0.153	

Δ Elevation < -0.25 ft Blue

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Δ Easting/Northing > 0.2 ft Blue

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-9264b	1027298.600	1878476.200	683.2	1027298.563	1878476.213	683.137	-0.037	0.013	-0.063	
7	R7-3-9265b	1027312.600	1878491.700	683.8	1027312.604	1878491.762	683.626	0.004	0.062	-0.174	
7	R7-3-9266b	1027324.800	1878506.300	684.6	1027324.756	1878506.284	684.539	-0.044	-0.016	-0.061	
7	R7-3-9267b	1027345.300	1878531.400	685.1	1027345.285	1878531.373	684.911	-0.015	-0.027	-0.189	
7	R7-3-9268b	1027352.800	1878541.900	684.8	1027352.736	1878541.844	684.556	-0.064	-0.056	-0.244	
7	R7-3-9276b	1027429.600	1878582.900	683.7	1027429.681	1878582.831	683.583	0.081	-0.069	-0.117	
7	R7-3-9287b	1027417.600	1878572.100	684.2	1027417.581	1878572.129	684.152	-0.019	0.029	-0.048	
7	R7-3-9288b	1027405.500	1878560.400	684	1027405.598	1878560.391	683.971	0.098	-0.009	-0.029	
7	R7-3-9289b	1027386.200	1878537.200	682.9	1027386.213	1878537.293	682.803	0.013	0.093	-0.097	
7	R7-3-9290b	1027333.400	1878516.200	683.7	1027333.468	1878516.138	683.620	0.068	-0.062	-0.080	
7	R7-3-9298b	1027463.700	1878573.500	684.6	1027463.757	1878573.465	684.558	0.057	-0.035	-0.042	
7	R7-3-9301b	1027492.700	1878603.600	685.4	1027492.656	1878603.609	685.376	-0.044	0.009	-0.024	
7	R7-3-9304b	1027434.800	1878538.700	684	1027434.802	1878538.697	683.994	0.002	-0.003	-0.006	
7	R7-3-9305b	1027501.200	1878611.700	685.2	1027501.134	1878611.722	685.121	-0.066	0.022	-0.079	
7	R7-3-9308b	1027454.700	1878612.900	684.1	1027454.600	1878612.913	683.890	-0.100	0.013	-0.210	
7	R7-3-9309b	1027466.000	1878623.900	684.1	1027465.991	1878623.991	684.040	-0.009	0.091	-0.060	
7	R7-3-9315b	1027458.400	1878565.400	684.5	1027458.479	1878565.429	684.304	0.079	0.029	-0.196	
7	R7-3-9325b	1027525.500	1878594.000	683.5	1027525.477	1878594.061	683.482	-0.023	0.061	-0.018	
7	R7-3-9327b	1027414.800	1878514.000	684.7	1027414.810	1878514.069	684.621	0.010	0.069	-0.079	
7	R7-3-9332b	1027492.200	1878554.900	683.6	1027492.248	1878554.905	683.511	0.048	0.005	-0.089	
7	R7-3-9337b	1027505.500	1878566.600	683.4	1027505.528	1878566.580	683.370	0.028	-0.020	-0.030	
7	R7-3-9339b	1027516.000	1878580.100	684.9	1027516.039	1878580.084	684.822	0.039	-0.016	-0.078	
7	R7-3-9340b	1027356.700	1878453.300	683.6	1027356.623	1878453.290	683.400	-0.077	-0.010	-0.200	
7	R7-3-9343b	1027482.300	1878543.500	683.4	1027482.223	1878543.505	683.189	-0.077	0.005	-0.211	
7	R7-3-9344b	1027436.400	1878496.000	683.5	1027436.457	1878495.990	683.404	0.057	-0.010	-0.096	
7	R7-3-9345b	1027425.500	1878486.200	683.8	1027425.442	1878486.200	683.697	-0.058	0.000	-0.103	
7	R7-3-9346b	1027412.600	1878468.700	683.4	1027412.624	1878468.672	683.231	0.024	-0.028	-0.169	
7	R7-3-9347b	1027400.700	1878459.800	684.2	1027400.747	1878459.808	683.983	0.047	0.008	-0.217	
7	R7-3-9348b	1027456.500	1878516.200	685	1027456.503	1878516.169	684.889	0.003	-0.031	-0.111	
7	R7-3-9349b	1027395.600	1878446.400	683.3	1027395.650	1878446.459	683.173	0.050	0.059	-0.127	
7	R7-3-9350b	1027382.200	1878426.300	684.7	1027382.163	1878426.292	684.570	-0.037	-0.008	-0.130	
7	R7-3-9352b	1027447.400	1878507.300	684	1027447.354	1878507.335	683.806	-0.046	0.035	-0.194	
7	R7-3-9354b	1027471.400	1878529.600	683	1027471.409	1878529.678	682.952	0.009	0.078	-0.048	
7	R7-3-9358b	1027445.800	1878551.800	683.8	1027445.786	1878551.865	683.740	-0.014	0.065	-0.060	
7	R7-3-9360b	1027399.700	1878499.600	684	1027399.697	1878499.628	683.993	-0.003	0.028	-0.007	
7	R7-3-9365b	1027390.200	1878488.900	683.7	1027390.261	1878488.866	683.501	0.061	-0.034	-0.199	
7	R7-3-9369b	1027425.500	1878529.000	684.1	1027425.561	1878529.036	684.087	0.061	0.036	-0.013	

Δ Elevation < -0.25 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-9375b	1027377.000	1878474.200	683.5	1027376.998	1878474.235	683.471	-0.002	0.035	-0.029	
7	R7-3-9377b	1027347.200	1878441.700	685.6	1027347.233	1878441.642	685.383	0.033	-0.058	-0.217	
7	R7-3-9379b	1027371.100	1878466.800	683.5	1027371.079	1878466.821	683.362	-0.021	0.021	-0.138	
7	R7-3-9418b	1027519.200	1878484.200	685.2	1027519.249	1878484.153	684.983	0.049	-0.047	-0.217	
7	R7-3-9419b	1027409.000	1878411.800	685.9	1027409.049	1878411.868	685.751	0.049	0.068	-0.149	
7	R7-3-9421b	1027400.800	1878403.200	687	1027400.818	1878403.178	686.853	0.018	-0.022	-0.147	
7	R7-3-9422b	1027481.200	1878496.200	683.7	1027481.165	1878496.244	683.677	-0.035	0.044	-0.023	
7	R7-3-9424b	1027539.200	1878511.900	684.1	1027539.134	1878511.868	684.052	-0.066	-0.032	-0.048	
7	R7-3-9425b	1027552.200	1878522.500	683.9	1027552.159	1878522.558	683.714	-0.041	0.058	-0.186	
7	R7-3-9426b	1027531.800	1878497.300	684.9	1027531.886	1878497.279	684.667	0.086	-0.021	-0.233	
7	R7-3-9427b	1027508.800	1878476.100	684.9	1027508.829	1878476.113	684.881	0.029	0.013	-0.019	
7	R7-3-9430b	1027437.900	1878446.700	683.5	1027437.912	1878446.670	683.414	0.012	-0.030	-0.086	
7	R7-3-9431b	1027576.800	1878504.800	682	1027576.794	1878504.783	681.977	-0.006	-0.017	-0.023	
7	R7-3-9433b	1027566.600	1878492.500	684	1027566.603	1878492.530	683.909	0.003	0.030	-0.091	
7	R7-3-9434b	1027525.200	1878547.400	683.7	1027525.293	1878547.439	683.561	0.093	0.039	-0.139	
7	R7-3-9439b	1027576.900	1878458.100	685	1027576.871	1878458.124	684.855	-0.029	0.024	-0.145	
7	R7-3-9440b	1027499.800	1878463.300	684.4	1027499.811	1878463.314	684.326	0.011	0.014	-0.074	
7	R7-3-9445b	1027536.800	1878558.000	683.3	1027536.810	1878557.933	683.281	0.010	-0.067	-0.019	
7	R7-3-9451b	1027422.400	1878424.000	683.8	1027422.369	1878424.030	683.702	-0.031	0.030	-0.098	
7	R7-3-9453b	1027431.400	1878433.900	684	1027431.348	1878433.840	683.870	-0.052	-0.060	-0.130	
7	R7-3-9457b	1027505.800	1878520.900	682.7	1027505.782	1878520.944	682.494	-0.018	0.044	-0.206	
7	R7-3-9458b	1027514.300	1878534.200	683.1	1027514.255	1878534.272	683.080	-0.045	0.072	-0.020	
7	R7-3-9459b	1027471.200	1878483.800	684.2	1027471.270	1878483.868	684.131	0.070	0.068	-0.069	
7	R7-3-9460b	1027461.100	1878473.500	684.1	1027461.104	1878473.468	683.972	0.004	-0.032	-0.128	
7	R7-3-9461b	1027496.100	1878511.600	683.3	1027496.099	1878511.546	683.051	-0.001	-0.054	-0.249	
7	R7-3-9462b	1027447.300	1878454.000	684	1027447.269	1878454.065	683.883	-0.031	0.065	-0.117	
7	R7-3-9496b	1027624.400	1878461.400	684	1027624.401	1878461.321	683.763	0.001	-0.079	-0.237	
7	R7-3-9505b	1027639.200	1878428.400	684.2	1027639.222	1878428.463	683.955	0.022	0.063	-0.245	
7	R7-3-9506b	1027649.000	1878436.300	684.5	1027649.060	1878436.335	684.252	0.060	0.035	-0.248	
7	R7-3-9508b	1027616.100	1878447.000	684.3	1027616.158	1878447.053	684.267	0.058	0.053	-0.033	
7	R7-3-9511b	1027648.200	1878484.000	683	1027648.136	1878484.034	682.767	-0.064	0.034	-0.233	
7	R7-3-9517b	1027609.800	1878496.600	682.2	1027609.848	1878496.590	682.117	0.048	-0.010	-0.083	
7	R7-3-9521b	1027661.300	1878448.500	683.9	1027661.310	1878448.524	683.664	0.010	0.024	-0.236	
7	R7-3-9548b	1027733.400	1878384.400	684.1	1027733.339	1878384.386	684.034	-0.061	-0.014	-0.066	
7	R7-3-9550b	1027663.600	1878402.600	684.9	1027663.512	1878402.541	684.881	-0.088	-0.059	-0.019	
7	R7-3-9551b	1027717.600	1878404.800	684	1027717.605	1878404.828	683.870	0.005	0.028	-0.130	
7	R7-3-9553b	1027649.200	1878399.800	685.7	1027649.261	1878399.750	685.460	0.061	-0.050	-0.240	

Δ Elevation < -0.25 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-9559b	1027700.600	1878358.900	686.9	1027700.672	1878358.928	686.862	0.072	0.028	-0.038	
7	R7-3-9560b	1027722.800	1878376.200	684.8	1027722.825	1878376.142	684.595	0.025	-0.058	-0.205	
7	R7-3-9561b	1027712.300	1878366.700	684.3	1027712.213	1878366.628	684.282	-0.087	-0.072	-0.018	
7	R7-3-9569b	1027678.200	1878419.800	684.3	1027678.145	1878419.848	684.129	-0.055	0.048	-0.171	
7	R7-3-9571b	1027759.700	1878361.900	683.1	1027759.600	1878361.924	683.097	-0.100	0.024	-0.003	
7	R7-3-9577b	1027688.300	1878429.300	684.1	1027688.327	1878429.369	683.851	0.027	0.069	-0.249	
7	R7-3-9597b	1027737.300	1878340.300	685.1	1027737.359	1878340.297	685.051	0.059	-0.003	-0.049	
7	R7-3-9599b	1027748.500	1878350.900	684.1	1027748.444	1878350.897	684.022	-0.056	-0.003	-0.078	
7	R7-3-9614b	1027783.900	1878191.800	684.5	1027783.850	1878191.758	684.497	-0.050	-0.042	-0.003	
7	R7-3-9615b	1027776.200	1878182.200	685.5	1027776.150	1878182.134	685.253	-0.050	-0.066	-0.247	
7	R7-3-9616b	1027764.800	1878167.200	687.4	1027764.792	1878167.194	687.161	-0.008	-0.006	-0.239	
7	R7-3-9617b	1027753.500	1878157.200	688.3	1027753.515	1878157.135	688.060	0.015	-0.065	-0.240	
7	R7-3-9618b	1027744.700	1878145.000	688.1	1027744.789	1878144.960	687.867	0.089	-0.040	-0.233	
7	R7-3-9620b	1027732.600	1878132.000	687.6	1027732.689	1878132.019	687.383	0.089	0.019	-0.217	
7	R7-3-9621b	1027776.100	1878286.300	682.7	1027776.064	1878286.325	682.456	-0.036	0.025	-0.244	
7	R7-3-9624b	1027824.800	1878238.000	683.2	1027824.812	1878238.029	683.164	0.012	0.029	-0.036	
7	R7-3-9625b	1027766.400	1878275.200	683.6	1027766.395	1878275.190	683.503	-0.005	-0.010	-0.097	
7	R7-3-9626b	1027802.400	1878313.000	684.6	1027802.335	1878313.005	684.010	-0.065	0.005	-0.590	Isolated over excavation of Targeted Material
7	R7-3-9627b	1027821.100	1878218.800	682	1027821.098	1878218.895	681.938	-0.002	0.095	-0.062	
7	R7-3-9634b	1027792.000	1878302.400	683.3	1027791.937	1878302.380	683.085	-0.063	-0.020	-0.215	
7	R7-3-9639b	1027808.900	1878215.800	683.9	1027808.849	1878215.781	683.668	-0.051	-0.019	-0.232	
7	R7-3-9643b	1027796.000	1878208.800	685.3	1027796.016	1878208.858	685.171	0.016	0.058	-0.129	
7	R7-3-9644b	1027687.400	1878381.500	684.8	1027687.346	1878381.475	684.606	-0.054	-0.025	-0.194	
7	R7-3-9645b	1027701.800	1878396.200	685	1027701.703	1878396.267	684.848	-0.097	0.067	-0.152	
7	R7-3-9655b	1027674.600	1878375.700	688	1027674.604	1878375.746	687.814	0.004	0.046	-0.186	
7	R7-3-9657b	1027763.900	1878319.100	683.4	1027763.892	1878319.171	683.260	-0.008	0.071	-0.140	
7	R7-3-9658b	1027774.700	1878332.800	682.9	1027774.600	1878332.842	682.768	-0.100	0.042	-0.132	
7	R7-3-9699b	1027768.900	1878121.400	688.2	1027768.902	1878121.350	688.066	0.002	-0.050	-0.134	
7	R7-3-9702b	1027850.400	1878222.400	682.7	1027850.473	1878222.382	682.525	0.073	-0.018	-0.175	
7	R7-3-9705b	1027822.600	1878187.000	683.6	1027822.628	1878186.972	683.465	0.028	-0.028	-0.135	
7	R7-3-9706b	1027811.900	1878178.200	685.4	1027811.903	1878178.189	685.154	0.003	-0.011	-0.246	
7	R7-3-9707b	1027798.600	1878160.500	684.7	1027798.565	1878160.461	684.542	-0.035	-0.039	-0.158	
7	R7-3-9708b	1027660.000	1878150.200	686.7	1027659.975	1878150.238	686.644	-0.025	0.038	-0.056	
7	R7-3-9709b	1027773.700	1878131.300	687.8	1027773.602	1878131.340	687.731	-0.098	0.040	-0.069	
7	R7-3-9713b	1027835.000	1878197.600	683.7	1027834.992	1878197.554	683.659	-0.008	-0.046	-0.041	
7	R7-3-9717b	1027843.300	1878207.900	684	1027843.283	1878207.987	683.995	-0.017	0.087	-0.005	
7	R7-3-9719b	1027788.000	1878149.900	684.4	1027788.027	1878149.819	684.246	0.027	-0.081	-0.154	

Δ Elevation < -0.25 ft Blue

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS
Bottom of Targeted Material
Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-9724b	1027671.600	1878165.400	686.5	1027671.520	1878165.353	686.270	-0.080	-0.047	-0.230	
7	R7-3-9725b	1027681.100	1878178.500	687.3	1027681.145	1878178.498	687.139	0.045	-0.002	-0.161	
7	R7-3-9726b	1027693.900	1878193.400	687.6	1027693.900	1878193.421	687.490	0.000	0.021	-0.110	
7	R7-3-9732b	1027703.800	1878205.500	687.4	1027703.821	1878205.574	687.219	0.021	0.074	-0.181	
7	R7-3-9737b	1027737.900	1878236.000	685.7	1027737.964	1878236.055	685.674	0.064	0.055	-0.026	
7	R7-3-9740b	1027773.400	1878229.700	684	1027773.498	1878229.683	683.866	0.098	-0.017	-0.134	
7	R7-3-9744b	1027783.900	1878243.600	683.5	1027783.858	1878243.502	683.259	-0.042	-0.098	-0.241	
7	R7-3-9764b	1027869.800	1878194.200	683.2	1027869.705	1878194.175	683.056	-0.095	-0.025	-0.144	
7	R7-3-9765b	1027833.300	1878150.600	684.2	1027833.205	1878150.608	684.057	-0.095	0.008	-0.143	
7	R7-3-9766b	1027823.700	1878137.800	685.4	1027823.679	1878137.836	685.227	-0.021	0.036	-0.173	
7	R7-3-9767b	1027860.100	1878176.200	684.3	1027859.992	1878176.248	684.090	-0.108	0.048	-0.210	
7	R7-3-9768b	1027815.700	1878126.600	685.2	1027815.735	1878126.666	684.963	0.035	0.066	-0.237	
7	R7-3-9769b	1027803.700	1878114.400	683.2	1027803.601	1878114.365	683.083	-0.099	-0.035	-0.117	
7	R7-3-9770b	1027792.400	1878100.600	687.9	1027792.321	1878100.580	687.820	-0.079	-0.020	-0.080	
7	R7-3-9772b	1027846.400	1878164.300	683.6	1027846.313	1878164.273	683.565	-0.087	-0.027	-0.035	
7	R7-3-9774b	1027693.700	1878142.700	687.2	1027693.735	1878142.663	686.968	0.035	-0.037	-0.232	
7	R7-3-9775b	1027748.900	1878202.200	687.7	1027748.838	1878202.177	687.673	-0.062	-0.023	-0.027	
7	R7-3-9776b	1027740.300	1878191.900	687.3	1027740.269	1878191.927	687.058	-0.031	0.027	-0.242	
7	R7-3-9777b	1027728.300	1878177.800	687.3	1027728.305	1878177.899	687.067	0.005	0.099	-0.233	
7	R7-3-9780b	1027715.700	1878163.600	687.8	1027715.772	1878163.536	687.559	0.072	-0.064	-0.241	
7	R7-3-9782b	1027703.300	1878153.200	687.4	1027703.297	1878153.177	687.228	-0.003	-0.023	-0.172	
7	R7-3-9798b	1027872.300	1878175.800	684.9	1027872.295	1878175.884	684.760	-0.005	0.084	-0.140	
7	R7-3-9800b	1027856.200	1878126.100	683.7	1027856.235	1878126.069	683.661	0.035	-0.031	-0.039	
7	R7-3-9801b	1027814.900	1878099.000	685.5	1027814.910	1878099.027	685.306	0.010	0.027	-0.194	
7	R7-3-9802b	1027830.500	1878109.100	683.8	1027830.551	1878109.120	683.752	0.051	0.020	-0.048	
7	R7-3-9803b	1027842.900	1878118.300	684	1027842.896	1878118.243	683.823	-0.004	-0.057	-0.177	
7	R7-3-9804b	1027871.600	1878136.800	683.2	1027871.568	1878136.781	683.000	-0.032	-0.019	-0.200	
7	R7-3-9805b	1027899.500	1878152.700	684.3	1027899.460	1878152.763	684.148	-0.040	0.063	-0.152	
7	R7-3-9806b	1027882.800	1878143.500	684.2	1027882.840	1878143.575	684.110	0.040	0.075	-0.090	
7	R7-3-9809b	1027793.900	1878255.000	683.7	1027793.973	1878255.015	683.608	0.073	0.015	-0.092	
7	R7-3-9812b	1027807.000	1878254.800	684.4	1027806.963	1878254.804	684.303	-0.037	0.004	-0.097	
7	R7-3-9813b	1027821.800	1878267.500	683	1027821.870	1878267.469	682.967	0.070	-0.031	-0.033	
7	R7-3-9818b	1027857.600	1878165.700	683.6	1027857.592	1878165.605	683.517	-0.008	-0.095	-0.083	
7	R7-3-9876b	1027944.600	1877837.900	684.6	1027944.542	1877837.866	684.362	-0.058	-0.034	-0.238	
7	R7-3-9877b	1027969.300	1877926.800	685	1027969.295	1877926.847	684.762	-0.005	0.047	-0.238	
7	R7-3-9879b	1027953.100	1877919.300	682.7	1027953.097	1877919.347	682.561	-0.003	0.047	-0.139	
7	R7-3-9880b	1027890.900	1878098.300	684	1027890.886	1878098.330	683.933	-0.014	0.030	-0.067	

Δ Elevation < -0.25 ft Blue

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Δ Easting/Northing > 0.2 ft Blue

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-9882b	1027986.300	1877862.500	682.8	1027986.363	1877862.459	682.558	.063	-.041	-.242	
7	R7-3-9886b	1027866.100	1878012.000	683.3	1027866.053	1878011.935	683.215	-.047	-.065	-.085	
7	R7-3-9889b	1027831.300	1878068.600	683.1	1027831.352	1878068.548	682.899	.052	-.052	-.201	
7	R7-3-9892b	1027900.400	1878112.700	684.5	1027900.441	1878112.785	684.359	.041	.085	-.141	
7	R7-3-9893b	1027998.800	1877872.000	684	1027998.863	1877872.011	683.788	.063	.011	-.212	
7	R7-3-9894b	1027850.000	1878078.600	684.9	1027850.074	1878078.570	684.739	.074	-.030	-.161	
7	R7-3-9897b	1027876.200	1878092.700	683.9	1027876.257	1878092.723	683.828	.057	.023	-.072	
7	R7-3-9898b	1027860.800	1878085.200	684.4	1027860.771	1878085.183	684.192	-.029	-.017	-.208	
7	R7-3-9900b	1027970.700	1877851.500	682.6	1027970.665	1877851.460	682.512	-.035	-.040	-.088	
7	R7-3-9901b	1027955.400	1877843.900	683.2	1027955.398	1877843.927	683.041	-.002	.027	-.159	
7	R7-3-9904b	1028006.800	1877795.300	683	1028006.802	1877795.348	682.873	.002	.048	-.127	
7	R7-3-9909b	1027976.600	1877773.400	683.4	1027976.582	1877773.382	683.262	-.018	-.018	-.138	
7	R7-3-9920b	1027938.800	1877986.800	683.6	1027938.825	1877986.835	683.366	.025	.035	-.234	
7	R7-3-9926b	1027905.700	1878037.600	682.8	1027905.666	1878037.602	682.685	-.034	.002	-.115	
7	R7-3-9927b	1027882.700	1878013.800	683.1	1027882.693	1878013.828	683.017	-.007	.028	-.083	
7	R7-3-9928b	1027900.500	1878016.300	682.9	1027900.438	1878016.301	682.769	-.062	.001	-.131	
7	R7-3-9933b	1027924.100	1877977.800	682.9	1027924.013	1877977.790	682.693	-.087	-.010	-.207	
7	R7-3-9934b	1027914.200	1877892.800	684.9	1027914.251	1877892.761	684.773	.051	-.039	-.127	
7	R7-3-9936b	1027899.400	1877885.900	685.1	1027899.427	1877885.902	684.862	.027	.002	-.238	
7	R7-3-9937b	1027885.300	1877881.500	688.1	1027885.332	1877881.468	687.870	.032	-.032	-.230	
7	R7-3-9938b	1027928.500	1877897.100	683.9	1027928.504	1877897.056	683.746	.004	-.044	-.154	
7	R7-3-9940b	1028018.300	1877804.400	683.7	1028018.255	1877804.407	683.470	-.045	.007	-.230	
7	R7-3-9949b	1027992.200	1877786.200	682.9	1027992.205	1877786.204	682.683	.005	.004	-.217	
7	R7-3-9957b	1028036.300	1877736.900	685.8	1028036.358	1877736.924	685.638	.058	.024	-.162	
7	R7-3-9960b	1028049.000	1877743.800	685.2	1028048.987	1877743.751	684.961	-.013	-.049	-.239	
7	R7-3-9963b	1028007.300	1877750.200	685.7	1028007.262	1877750.149	685.464	-.038	-.051	-.236	
7	R7-3-9964b	1027969.900	1877745.700	685.5	1027969.889	1877745.683	685.437	-.011	-.017	-.063	
7	R7-3-9966b	1027957.000	1877814.600	684.4	1027957.016	1877814.596	684.193	.016	-.004	-.207	
7	R7-3-9973b	1027968.400	1877821.900	683	1027968.427	1877821.909	682.861	.027	.009	-.139	
7	R7-3-9974b	1027989.300	1877823.500	683.8	1027989.284	1877823.460	683.564	-.016	-.040	-.236	
7	R7-3-9975b	1027987.200	1877746.900	681.9	1027987.187	1877746.924	681.831	-.013	.024	-.069	
7	R7-3-9976b	1027910.100	1877967.800	683.4	1027910.064	1877967.782	683.279	-.036	-.018	-.121	
7	R7-3-9978b	1027891.600	1877957.000	683.6	1027891.558	1877956.919	683.519	-.042	-.081	-.081	
7	R7-3-9979b	1027877.400	1877951.100	683.3	1027877.398	1877951.121	683.108	-.002	.021	-.192	
7	R7-3-9985b	1028025.800	1877720.200	686.3	1028025.797	1877720.176	686.082	-.003	-.024	-.218	
7	R7-3-9998b	1027985.200	1877896.100	683.5	1027985.199	1877896.061	683.255	-.001	-.039	-.245	
7	R7-3-9999b	1027923.600	1877861.300	682.4	1027923.582	1877861.337	682.336	-.018	.037	-.064	

Δ Elevation < -0.25 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-B1	1026901.700	1878907.100	686.1	1026901.703	1878907.156	685.877	0.003	0.056	-0.223	
7	R7-3-B10	1026953.300	1878893.100	683.6	1026953.302	1878893.044	683.449	0.002	-0.056	-0.151	
7	R7-3-B100	1027327.900	1878687.400	683.6	1027327.801	1878687.384	683.559	-0.099	-0.016	-0.041	
7	R7-3-B101	1026606.500	1878685.900	682.8	1026606.421	1878685.884	682.757	-0.079	-0.016	-0.043	
7	R7-3-B102	1026764.000	1878684.800	682	1026764.027	1878684.846	681.751	0.027	0.046	-0.249	
7	R7-3-B103	1027325.900	1878684.400	683.6	1027325.835	1878684.403	683.521	-0.065	0.003	-0.079	
7	R7-3-B104	1026772.100	1878679.400	682	1026772.069	1878679.436	681.889	-0.031	0.036	-0.111	
7	R7-3-B105	1027286.700	1878677.300	681.7	1027286.735	1878677.323	681.492	0.035	0.023	-0.208	
7	R7-3-B106	1026619.300	1878675.800	682.8	1026619.280	1878675.833	682.750	-0.020	0.033	-0.050	
7	R7-3-B107	1027319.600	1878675.600	682.4	1027319.610	1878675.615	682.229	0.010	0.015	-0.171	
7	R7-3-B108	1026654.000	1878673.100	683.6	1026653.973	1878673.091	683.481	-0.027	-0.009	-0.119	
7	R7-3-B109	1027339.700	1878671.900	683.4	1027339.646	1878671.870	683.342	-0.054	-0.030	-0.058	
7	R7-3-B111	1026777.800	1878891.700	687.5	1026777.783	1878891.646	687.288	-0.017	-0.054	-0.212	
7	R7-3-B110	1027294.300	1878669.000	686.7	1027294.344	1878668.926	686.467	0.044	-0.074	-0.233	
7	R7-3-B111	1026800.900	1878667.100	684.1	1026800.859	1878667.128	684.006	-0.041	0.028	-0.094	
7	R7-3-B112	1027315.900	1878666.600	686.7	1027315.905	1878666.593	686.682	0.005	-0.007	-0.018	
7	R7-3-B113	1027345.800	1878664.800	683.4	1027345.763	1878664.826	683.376	-0.037	0.026	-0.024	
7	R7-3-B114	1027306.300	1878664.700	686.7	1027306.314	1878664.761	686.690	0.014	0.061	-0.010	
7	R7-3-B115	1027333.500	1878663.100	683.4	1027333.585	1878663.133	683.247	0.085	0.033	-0.153	
7	R7-3-B116	1027329.200	1878657.000	686.8	1027329.207	1878657.060	686.781	0.007	0.060	-0.019	
7	R7-3-B117	1027356.500	1878656.600	683.1	1027356.457	1878656.552	683.028	-0.043	-0.048	-0.072	
7	R7-3-B118	1026807.500	1878655.400	684.1	1026807.492	1878655.371	683.870	-0.008	-0.029	-0.230	
7	R7-3-B119	1026676.500	1878654.000	685.9	1026676.525	1878654.027	685.783	0.025	0.027	-0.117	
7	R7-3-B12	1026875.200	1878891.700	684.2	1026875.190	1878891.721	684.123	-0.010	0.021	-0.077	
7	R7-3-B120	1026819.100	1878650.000	683	1026819.099	1878649.969	682.913	-0.001	-0.031	-0.087	
7	R7-3-B121	1026834.100	1878649.300	683	1026834.057	1878649.325	682.908	-0.043	0.025	-0.092	
7	R7-3-B122	1026863.500	1878649.000	686.7	1026863.511	1878649.024	686.463	0.011	0.024	-0.237	
7	R7-3-B123	1026854.900	1878647.000	686.7	1026854.918	1878646.973	686.679	0.018	-0.027	-0.021	
7	R7-3-B124	1027331.200	1878645.200	686.8	1027331.179	1878645.220	686.630	-0.021	0.020	-0.170	
7	R7-3-B125	1027367.700	1878645.100	683.1	1027367.765	1878645.030	682.985	0.065	-0.070	-0.115	
7	R7-3-B126	1026715.200	1878644.600	685	1026715.246	1878644.564	684.966	0.046	-0.036	-0.034	
7	R7-3-B127	1026868.000	1878642.100	683.8	1026867.958	1878642.096	683.554	-0.042	-0.004	-0.246	
7	R7-3-B128	1026851.700	1878638.400	682.7	1026851.687	1878638.390	682.576	-0.013	-0.010	-0.124	
7	R7-3-B129	1027388.500	1878636.800	683.4	1027388.525	1878636.816	683.279	0.025	0.016	-0.121	
7	R7-3-B13	1026796.900	1878889.100	684.2	1026796.909	1878889.127	684.091	0.009	0.027	-0.109	
7	R7-3-B130	1027432.000	1878636.500	685	1027432.000	1878636.455	684.951	0.000	-0.045	-0.049	
7	R7-3-B131	1026902.400	1878636.400	686.1	1026902.467	1878636.413	686.017	0.067	0.013	-0.083	

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-B132	1027341.500	1878633.700	686.5	1027341.455	1878633.625	686.276	-0.045	-0.075	-0.224	
7	R7-3-B133	1027471.400	1878632.500	685.1	1027471.368	1878632.464	685.039	-0.032	-0.036	-0.061	
7	R7-3-B134	1026746.800	1878631.600	685.4	1026746.831	1878631.665	685.279	0.031	0.065	-0.121	
7	R7-3-B135	1026930.700	1878630.800	686.6	1026930.664	1878630.791	686.511	-0.036	-0.009	-0.089	
7	R7-3-B136	1026946.800	1878620.700	686.6	1026946.865	1878620.768	686.407	0.065	0.068	-0.193	
7	R7-3-B137	1026774.800	1878619.500	685.9	1026774.802	1878619.455	685.659	0.002	-0.045	-0.241	
7	R7-3-B138	1027506.200	1878614.000	685.2	1027506.267	1878614.025	685.185	0.067	0.025	-0.015	
7	R7-3-B139	1027357.800	1878611.600	687.1	1027357.789	1878611.613	686.881	-0.011	0.013	-0.219	
7	R7-3-B14	1026852.200	1878887.200	686.1	1026852.197	1878887.220	685.919	-0.003	0.020	-0.181	
7	R7-3-B140	1026948.800	1878606.100	684.9	1026948.837	1878606.062	684.795	0.037	-0.038	-0.105	
7	R7-3-B141	1026956.200	1878604.900	684.9	1026956.111	1878604.839	684.860	-0.089	-0.061	-0.040	
7	R7-3-B142	1026804.500	1878604.000	686	1026804.459	1878604.023	685.938	-0.041	0.023	-0.062	
7	R7-3-B143	1027527.700	1878603.700	686.4	1027527.657	1878603.632	686.276	-0.043	-0.068	-0.124	
7	R7-3-B144	1027535.400	1878602.600	686.4	1027535.439	1878602.631	686.372	0.039	0.031	-0.028	
7	R7-3-B145	1027524.100	1878601.400	683.5	1027524.102	1878601.361	683.373	0.002	-0.039	-0.127	
7	R7-3-B146	1027356.400	1878599.500	687.1	1027356.461	1878599.532	686.890	0.061	0.032	-0.210	
7	R7-3-B147	1026821.000	1878599.300	685	1026820.956	1878599.310	684.912	-0.044	0.010	-0.088	
7	R7-3-B148	1026992.300	1878593.900	685.3	1026992.288	1878593.955	685.265	-0.012	0.055	-0.035	
7	R7-3-B149	1027354.300	1878593.500	687.1	1027354.328	1878593.418	687.080	0.028	-0.082	-0.020	
7	R7-3-B15	1026819.300	1878886.600	686.4	1026819.348	1878886.664	686.159	0.048	0.064	-0.241	
7	R7-3-B150	1026834.100	1878590.000	685	1026834.154	1878590.043	684.944	0.054	0.043	-0.056	
7	R7-3-B151	1027336.300	1878583.900	687.5	1027336.281	1878583.935	687.448	-0.019	0.035	-0.052	
7	R7-3-B152	1027358.800	1878583.400	683.6	1027358.791	1878583.361	683.575	-0.009	-0.039	-0.025	
7	R7-3-B153	1027022.800	1878582.400	684.5	1027022.811	1878582.348	684.372	0.011	-0.052	-0.128	
7	R7-3-B154	1026868.500	1878582.200	683.3	1026868.543	1878582.183	683.256	0.043	-0.017	-0.044	
7	R7-3-B155	1027049.600	1878573.000	683.1	1027049.567	1878572.982	683.051	-0.033	-0.018	-0.049	
7	R7-3-B156	1027550.400	1878570.100	686.3	1027550.421	1878570.105	686.223	0.021	0.005	-0.077	
7	R7-3-B157	1027324.900	1878569.700	687.2	1027324.973	1878569.688	687.168	0.073	-0.012	-0.032	
7	R7-3-B158	1027280.300	1878568.100	688.4	1027280.330	1878568.049	688.192	0.030	-0.051	-0.208	
7	R7-3-B159	1027264.900	1878564.500	688.4	1027264.862	1878564.522	688.373	-0.038	0.022	-0.027	
7	R7-3-B16	1027000.400	1878883.000	684.5	1027000.441	1878883.040	684.465	0.041	0.040	-0.035	
7	R7-3-B160	1026895.400	1878564.000	686.1	1026895.343	1878563.921	686.010	-0.057	-0.079	-0.090	
7	R7-3-B161	1026912.800	1878561.800	686.1	1026912.710	1878561.823	685.851	-0.090	0.023	-0.249	
7	R7-3-B162	1027086.000	1878559.000	685.2	1027086.065	1878559.017	685.099	0.065	0.017	-0.101	
7	R7-3-B163	1026930.600	1878555.800	683.8	1026930.546	1878555.785	683.753	-0.054	-0.015	-0.047	
7	R7-3-B164	1027309.400	1878554.600	683.4	1027309.399	1878554.643	683.339	-0.001	0.043	-0.061	
7	R7-3-B165	1027120.000	1878548.200	682.7	1027120.050	1878548.229	682.641	0.050	0.029	-0.059	

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS
Bottom of Targeted Material
Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-B166	1027246.700	1878547.400	686.7	1027246.696	1878547.439	686.579	-0.004	0.039	-0.121	
7	R7-3-B167	1027226.700	1878545.200	686.3	1027226.741	1878545.111	686.247	0.041	-0.089	-0.053	
7	R7-3-B168	1026954.300	1878536.800	685.3	1026954.307	1878536.738	685.249	0.007	-0.062	-0.051	
7	R7-3-B169	1027565.100	1878536.700	683.9	1027565.142	1878536.741	683.656	0.042	0.041	-0.244	
7	R7-3-B17	1026752.600	1878881.500	684.9	1026752.553	1878881.496	684.779	-0.047	-0.004	-0.121	
7	R7-3-B170	1027167.800	1878535.900	685.2	1027167.823	1878535.966	684.952	0.023	0.066	-0.248	
7	R7-3-B171	1027183.900	1878534.600	685.2	1027183.913	1878534.624	684.996	0.013	0.024	-0.204	
7	R7-3-B172	1027149.400	1878532.600	683.2	1027149.469	1878532.604	683.169	0.069	0.004	-0.031	
7	R7-3-B173	1026983.500	1878520.400	685.8	1026983.450	1878520.362	685.742	-0.050	-0.038	-0.058	
7	R7-3-B174	1027588.900	1878516.000	683.2	1027588.837	1878515.964	683.120	-0.063	-0.036	-0.080	
7	R7-3-B175	1027262.400	1878514.400	683.7	1027262.303	1878514.409	683.680	-0.097	0.009	-0.020	
7	R7-3-B176	1027618.000	1878505.900	683.6	1027617.970	1878505.838	683.584	-0.030	-0.062	-0.016	
7	R7-3-B177	1027271.000	1878505.100	683.7	1027270.948	1878505.149	683.541	-0.052	0.049	-0.159	
7	R7-3-B178	1027015.300	1878503.200	685.1	1027015.288	1878503.182	685.032	-0.012	-0.018	-0.068	
7	R7-3-B179	1027264.600	1878499.700	684.9	1027264.629	1878499.693	684.819	0.029	-0.007	-0.081	
7	R7-3-B18	1026949.800	1878878.800	684.1	1026949.734	1878878.754	683.887	-0.066	-0.046	-0.213	
7	R7-3-B180	1027048.100	1878495.300	686.3	1027048.057	1878495.338	686.069	-0.043	0.038	-0.231	
7	R7-3-B181	1027043.000	1878492.700	686.3	1027043.003	1878492.711	686.101	0.003	0.011	-0.199	
7	R7-3-B182	1027643.600	1878491.700	683	1027643.648	1878491.685	682.989	0.048	-0.015	-0.011	
7	R7-3-B183	1027655.300	1878491.200	681.6	1027655.324	1878491.270	681.564	0.024	0.070	-0.036	
7	R7-3-B184	1027640.700	1878489.400	683	1027640.672	1878489.391	682.974	-0.028	-0.009	-0.026	
7	R7-3-B185	1027629.100	1878489.200	683	1027629.157	1878489.179	682.762	0.057	-0.021	-0.238	
7	R7-3-B186	1027673.300	1878489.100	681.3	1027673.252	1878489.115	681.232	-0.048	0.015	-0.068	
7	R7-3-B187	1027276.900	1878487.500	684.9	1027276.818	1878487.459	684.715	-0.082	-0.041	-0.185	
7	R7-3-B188	1027665.300	1878487.300	681.3	1027665.248	1878487.326	681.222	-0.052	0.026	-0.078	
7	R7-3-B189	1027175.100	1878487.100	683.9	1027175.096	1878487.068	683.810	-0.004	-0.032	-0.090	
7	R7-3-B19	1026941.900	1878872.400	683.7	1026941.842	1878872.348	683.690	-0.058	-0.052	-0.010	
7	R7-3-B190	1027582.400	1878486.900	681.8	1027582.405	1878486.829	681.794	0.005	-0.071	-0.006	
7	R7-3-B191	1027190.800	1878485.900	685	1027190.840	1878485.949	684.759	0.040	0.049	-0.241	
7	R7-3-B192	1027083.700	1878485.700	685.4	1027083.671	1878485.731	685.178	-0.029	0.031	-0.222	
7	R7-3-B193	1027600.400	1878485.000	682.9	1027600.364	1878485.081	682.841	-0.036	0.081	-0.059	
7	R7-3-B194	1027166.800	1878484.900	683.9	1027166.785	1878484.892	683.771	-0.015	-0.008	-0.129	
7	R7-3-B195	1027613.300	1878484.700	682.9	1027613.387	1878484.716	682.726	0.087	0.016	-0.174	
7	R7-3-B196	1027676.600	1878484.400	681.3	1027676.605	1878484.465	681.118	0.005	0.065	-0.182	
7	R7-3-B197	1027555.200	1878482.100	684.3	1027555.191	1878482.025	684.107	-0.009	-0.075	-0.193	
7	R7-3-B198	1027230.000	1878480.600	683.7	1027229.959	1878480.649	683.520	-0.041	0.049	-0.180	
7	R7-3-B199	1027680.600	1878479.100	681.3	1027680.531	1878479.110	681.246	-0.069	0.010	-0.054	

Δ Elevation < -0.25 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-B2	1026920.900	1878907.100	685.2	1026920.899	1878907.053	685.095	-0.001	-0.047	-0.105	
7	R7-3-B20	1026964.700	1878870.800	684.1	1026964.703	1878870.855	683.998	0.003	0.055	-0.102	
7	R7-3-B200	1027642.200	1878477.600	683	1027642.176	1878477.594	682.752	-0.024	-0.006	-0.248	
7	R7-3-B201	1027660.700	1878476.800	681.3	1027660.636	1878476.829	681.255	-0.064	0.029	-0.045	
7	R7-3-B202	1027161.400	1878476.300	686.1	1027161.411	1878476.237	685.851	0.011	-0.063	-0.249	
7	R7-3-B203	1027523.600	1878474.700	685.2	1027523.527	1878474.608	684.978	-0.073	-0.092	-0.222	
7	R7-3-B204	1027245.300	1878472.900	682.7	1027245.379	1878472.888	682.688	0.079	-0.012	-0.012	
7	R7-3-B205	1027674.400	1878472.800	681.3	1027674.374	1878472.872	681.281	-0.026	0.072	-0.019	
7	R7-3-B206	1027146.200	1878472.400	686.1	1027146.237	1878472.455	686.031	0.037	0.055	-0.069	
7	R7-3-B207	1027542.300	1878472.100	683.5	1027542.227	1878472.100	683.390	-0.073	0.000	-0.110	
7	R7-3-B208	1027113.100	1878472.000	686.8	1027113.022	1878472.007	686.614	-0.078	0.007	-0.186	
7	R7-3-B209	1027697.900	1878471.400	684.5	1027697.844	1878471.362	684.477	-0.056	-0.038	-0.023	
7	R7-3-B21	1026918.400	1878868.300	685.5	1026918.339	1878868.278	685.268	-0.061	-0.022	-0.232	
7	R7-3-B210	1027587.700	1878471.100	683.4	1027587.767	1878471.115	683.180	0.067	0.015	-0.220	
7	R7-3-B211	1027613.400	1878468.600	683.3	1027613.432	1878468.525	683.293	0.032	-0.075	-0.007	
7	R7-3-B212	1027683.900	1878466.900	684.5	1027683.976	1878466.915	684.434	0.076	0.015	-0.066	
7	R7-3-B213	1027640.600	1878466.600	683.1	1027640.503	1878466.648	682.924	-0.097	0.048	-0.176	
7	R7-3-B214	1027630.300	1878466.300	683.1	1027630.273	1878466.265	682.983	-0.027	-0.035	-0.117	
7	R7-3-B215	1027511.700	1878465.900	684.9	1027511.630	1878465.875	684.803	-0.070	-0.025	-0.097	
7	R7-3-B216	1027703.900	1878465.800	682.2	1027703.883	1878465.796	682.131	-0.017	-0.004	-0.069	
7	R7-3-B217	1027563.600	1878460.900	683.5	1027563.614	1878460.978	683.427	0.014	0.078	-0.073	
7	R7-3-B218	1027654.400	1878460.700	683.9	1027654.450	1878460.626	683.652	0.050	-0.074	-0.248	
7	R7-3-B219	1027710.100	1878460.000	682.2	1027710.042	1878460.059	681.951	-0.058	0.059	-0.249	
7	R7-3-B22	1027026.100	1878864.900	683.6	1027026.086	1878864.919	683.402	-0.014	0.019	-0.198	
7	R7-3-B220	1027279.700	1878459.200	684.2	1027279.666	1878459.134	684.139	-0.034	-0.066	-0.061	
7	R7-3-B221	1027672.100	1878458.200	683.1	1027672.054	1878458.204	682.964	-0.046	0.004	-0.136	
7	R7-3-B222	1027568.800	1878455.900	685	1027568.734	1878455.861	684.834	-0.066	-0.039	-0.166	
7	R7-3-B223	1027575.800	1878455.400	685	1027575.872	1878455.481	684.920	0.072	0.081	-0.080	
7	R7-3-B224	1027484.100	1878452.600	683.1	1027484.033	1878452.585	683.050	-0.067	-0.015	-0.050	
7	R7-3-B225	1027504.400	1878452.600	684.3	1027504.413	1878452.679	684.200	0.013	0.079	-0.100	
7	R7-3-B226	1027290.500	1878449.900	684.2	1027290.526	1878449.850	684.049	0.026	-0.050	-0.151	
7	R7-3-B227	1027698.900	1878449.000	682.2	1027698.904	1878449.003	682.134	0.004	0.003	-0.066	
7	R7-3-B228	1027596.100	1878447.100	683.9	1027596.073	1878447.063	683.837	-0.027	-0.037	-0.063	
7	R7-3-B229	1027729.500	1878446.600	681	1027729.586	1878446.540	680.966	0.086	-0.060	-0.034	
7	R7-3-B23	1026974.200	1878864.400	684.8	1026974.247	1878864.351	684.572	0.047	-0.049	-0.228	
7	R7-3-B230	1027605.700	1878446.000	683.9	1027605.620	1878445.883	683.860	-0.080	-0.117	-0.040	
7	R7-3-B231	1027305.800	1878445.400	685.2	1027305.727	1878445.440	684.976	-0.073	0.040	-0.224	

Δ Elevation < -0.25 ft Blue

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Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-B232	1027601.900	1878443.500	683.9	1027601.937	1878443.449	683.665	0.037	-0.051	-0.235	
7	R7-3-B233	1027613.700	1878443.300	684.3	1027613.681	1878443.267	684.211	-0.019	-0.033	-0.089	
7	R7-3-B234	1027473.400	1878442.000	685.1	1027473.468	1878441.970	684.879	0.068	-0.030	-0.221	
7	R7-3-B235	1027735.900	1878440.100	681	1027735.998	1878440.029	680.989	0.098	-0.071	-0.011	
7	R7-3-B236	1027697.900	1878438.600	682.5	1027697.902	1878438.555	682.469	0.002	-0.045	-0.031	
7	R7-3-B237	1027722.500	1878438.200	681	1027722.437	1878438.243	680.861	-0.063	0.043	-0.139	
7	R7-3-B238	1027337.700	1878433.600	686.5	1027337.677	1878433.658	686.464	-0.023	0.058	-0.036	
7	R7-3-B239	1027698.200	1878431.400	682.5	1027698.112	1878431.365	682.484	-0.088	-0.035	-0.016	
7	R7-3-B24	1026743.700	1878862.500	684.5	1026743.633	1878862.513	684.277	-0.067	0.013	-0.223	
7	R7-3-B240	1027731.500	1878431.000	681	1027731.533	1878431.070	680.909	0.033	0.070	-0.091	
7	R7-3-B241	1027461.300	1878427.600	684.1	1027461.294	1878427.663	683.923	-0.006	0.063	-0.177	
7	R7-3-B242	1027711.300	1878426.900	682.6	1027711.278	1878426.841	682.490	-0.022	-0.059	-0.110	
7	R7-3-B243	1027633.000	1878425.100	684.2	1027633.064	1878425.096	683.984	0.064	-0.004	-0.216	
7	R7-3-B244	1027639.800	1878420.200	684.2	1027639.861	1878420.203	684.150	0.061	0.003	-0.050	
7	R7-3-B245	1027720.300	1878420.000	682.6	1027720.295	1878420.002	682.584	-0.005	0.002	-0.016	
7	R7-3-B246	1027370.900	1878418.700	687.7	1027370.928	1878418.613	687.455	0.028	-0.087	-0.245	
7	R7-3-B247	1027450.700	1878416.200	687.2	1027450.691	1878416.151	686.998	-0.009	-0.049	-0.202	
7	R7-3-B248	1027727.200	1878406.900	683.6	1027727.228	1878406.924	683.488	0.028	0.024	-0.112	
7	R7-3-B249	1027644.800	1878406.000	685.7	1027644.770	1878405.950	685.457	-0.030	-0.050	-0.243	
7	R7-3-B25	1026881.500	1878862.000	684.4	1026881.563	1878862.049	684.317	0.063	0.049	-0.083	
7	R7-3-B250	1027440.400	1878401.400	686.4	1027440.392	1878401.329	686.328	-0.008	-0.071	-0.072	
7	R7-3-B251	1027391.200	1878396.800	688.7	1027391.181	1878396.726	688.609	-0.019	-0.074	-0.091	
7	R7-3-B252	1027643.200	1878396.600	685.7	1027643.268	1878396.624	685.454	0.068	0.024	-0.246	
7	R7-3-B253	1027738.700	1878393.400	683	1027738.635	1878393.414	682.926	-0.065	0.014	-0.074	
7	R7-3-B254	1027760.700	1878388.400	682.4	1027760.629	1878388.395	682.229	-0.071	-0.005	-0.171	
7	R7-3-B255	1027435.800	1878386.900	686.7	1027435.787	1878386.838	686.463	-0.013	-0.062	-0.237	
7	R7-3-B256	1027399.000	1878379.700	687.1	1027398.938	1878379.701	686.878	-0.062	0.001	-0.222	
7	R7-3-B257	1027671.800	1878375.000	688	1027671.841	1878375.093	687.773	0.041	0.093	-0.227	
7	R7-3-B258	1027431.600	1878370.300	686.4	1027431.649	1878370.233	686.308	0.049	-0.067	-0.092	
7	R7-3-B259	1027762.400	1878365.400	683.1	1027762.471	1878365.461	683.018	0.071	0.061	-0.082	
7	R7-3-B26	1026724.900	1878859.200	687.2	1026724.867	1878859.105	687.115	-0.033	-0.095	-0.085	
7	R7-3-B260	1027683.900	1878363.900	688.6	1027683.950	1878363.971	688.520	0.050	0.071	-0.080	
7	R7-3-B261	1027771.500	1878360.000	683.1	1027771.460	1878359.945	682.871	-0.040	-0.055	-0.229	
7	R7-3-B262	1027409.200	1878359.200	687.2	1027409.141	1878359.215	687.151	-0.059	0.015	-0.049	
7	R7-3-B263	1027696.900	1878355.500	686.9	1027696.947	1878355.474	686.865	0.047	-0.026	-0.035	
7	R7-3-B264	1027422.600	1878353.600	687.5	1027422.554	1878353.557	687.421	-0.046	-0.043	-0.079	
7	R7-3-B265	1027673.200	1878353.300	688.6	1027673.263	1878353.297	688.365	0.063	-0.003	-0.235	

Δ Elevation < -0.25 ft Blue

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-B266	1027769.900	1878349.300	683.1	1027769.956	1878349.326	683.009	0.056	0.026	-0.091	
7	R7-3-B267	1027690.200	1878348.900	686.9	1027690.170	1878348.907	686.684	-0.030	0.007	-0.216	
7	R7-3-B268	1027707.700	1878346.300	686.9	1027707.712	1878346.363	686.855	0.012	0.063	-0.045	
7	R7-3-B269	1027695.100	1878342.800	686.9	1027695.120	1878342.759	686.746	0.020	-0.041	-0.154	
7	R7-3-B27	1026958.800	1878858.300	685.7	1026958.768	1878858.346	685.577	-0.032	0.046	-0.123	
7	R7-3-B270	1027428.000	1878342.600	687.5	1027428.074	1878342.534	687.377	0.074	-0.066	-0.123	
7	R7-3-B271	1027416.500	1878341.500	687.5	1027416.418	1878341.533	687.264	-0.082	0.033	-0.236	
7	R7-3-B272	1027729.800	1878340.400	685.1	1027729.880	1878340.363	685.086	0.080	-0.037	-0.014	
7	R7-3-B273	1027735.100	1878337.800	685.1	1027735.100	1878337.873	685.012	0.000	0.073	-0.088	
7	R7-3-B274	1027678.200	1878335.800	687.4	1027678.187	1878335.745	687.397	-0.013	-0.055	-0.003	
7	R7-3-B275	1027724.200	1878334.700	686.6	1027724.211	1878334.781	686.464	0.011	0.081	-0.136	
7	R7-3-B276	1027777.400	1878334.700	682.9	1027777.358	1878334.663	682.744	-0.042	-0.037	-0.156	
7	R7-3-B277	1027717.600	1878334.500	686.6	1027717.655	1878334.507	686.598	0.055	0.007	-0.002	
7	R7-3-B278	1027705.000	1878331.000	688.1	1027704.968	1878331.032	687.867	-0.032	0.032	-0.233	
7	R7-3-B279	1027429.000	1878326.800	687	1027428.976	1878326.807	686.829	-0.024	0.007	-0.171	
7	R7-3-B28	1026708.200	1878856.800	684.7	1026708.149	1878856.746	684.625	-0.051	-0.054	-0.075	
7	R7-3-B280	1027710.400	1878325.500	686.9	1027710.352	1878325.576	686.889	-0.048	0.076	-0.011	
7	R7-3-B281	1027418.200	1878324.100	687	1027418.209	1878324.122	686.908	0.009	0.022	-0.092	
7	R7-3-B282	1027739.300	1878323.700	686.2	1027739.357	1878323.722	686.140	0.057	0.022	-0.060	
7	R7-3-B283	1027683.000	1878318.900	685.9	1027683.068	1878318.930	685.679	0.068	0.030	-0.221	
7	R7-3-B284	1027806.500	1878315.600	684.6	1027806.560	1878315.656	684.382	0.060	0.056	-0.218	
7	R7-3-B285	1027751.700	1878308.700	683.2	1027751.770	1878308.683	682.961	0.070	-0.017	-0.239	
7	R7-3-B286	1027424.500	1878307.500	686.7	1027424.590	1878307.477	686.570	0.090	-0.023	-0.130	
7	R7-3-B287	1027717.500	1878307.500	686.5	1027717.503	1878307.497	686.290	0.003	-0.003	-0.210	
7	R7-3-B288	1027682.900	1878306.300	691.7	1027682.937	1878306.336	691.662	0.037	0.036	-0.038	
7	R7-3-B289	1027440.700	1878302.600	686.7	1027440.719	1878302.528	686.681	0.019	-0.072	-0.019	
7	R7-3-B29	1026949.400	1878852.700	685.7	1026949.382	1878852.637	685.534	-0.018	-0.063	-0.166	
7	R7-3-B290	1027755.200	1878301.300	684.3	1027755.193	1878301.257	684.055	-0.007	-0.043	-0.245	
7	R7-3-B291	1027750.400	1878299.400	684.3	1027750.432	1878299.411	684.057	0.032	0.011	-0.243	
7	R7-3-B292	1027719.800	1878298.800	686.5	1027719.852	1878298.831	686.400	0.052	0.031	-0.100	
7	R7-3-B293	1027425.600	1878296.100	686.7	1027425.681	1878296.117	686.499	0.081	0.017	-0.201	
7	R7-3-B294	1027444.700	1878294.900	686.7	1027444.738	1878294.947	686.628	0.038	0.047	-0.072	
7	R7-3-B295	1027682.700	1878294.300	691.7	1027682.669	1878294.274	691.644	-0.031	-0.026	-0.056	
7	R7-3-B296	1027714.500	1878292.700	686.4	1027714.403	1878292.649	686.254	-0.097	-0.051	-0.146	
7	R7-3-B297	1027491.500	1878292.300	687.4	1027491.510	1878292.333	687.287	0.010	0.033	-0.113	
7	R7-3-B298	1027431.900	1878292.200	686.7	1027431.951	1878292.203	686.513	0.051	0.003	-0.187	
7	R7-3-B299	1027512.600	1878291.700	687.8	1027512.645	1878291.689	687.765	0.045	-0.011	-0.035	

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-B3	1026765.800	1878905.600	687.5	1026765.801	1878905.532	687.295	.001	-0.068	-0.205	
7	R7-3-B30	1026964.800	1878852.000	685.7	1026964.772	1878852.015	685.637	-0.028	0.015	-0.063	
7	R7-3-B300	1027826.100	1878291.400	682	1027826.075	1878291.456	681.764	-0.025	0.056	-0.236	
7	R7-3-B301	1027495.900	1878290.400	687.4	1027495.919	1878290.458	687.242	.019	0.058	-0.158	
7	R7-3-B302	1027700.900	1878289.200	686.5	1027700.905	1878289.158	686.409	.005	-0.042	-0.091	
7	R7-3-B303	1027552.300	1878288.800	687.2	1027552.340	1878288.803	686.966	.040	0.003	-0.234	
7	R7-3-B304	1027758.100	1878286.100	687	1027758.112	1878286.197	686.874	.012	0.097	-0.126	
7	R7-3-B305	1027483.700	1878284.400	686.5	1027483.664	1878284.424	686.447	-0.036	0.024	-0.053	
7	R7-3-B306	1027717.300	1878283.900	687.1	1027717.282	1878283.824	687.010	-0.018	-0.076	-0.090	
7	R7-3-B307	1027823.100	1878282.700	682	1027823.056	1878282.642	681.828	-0.044	-0.058	-0.172	
7	R7-3-B308	1027468.400	1878282.600	686.7	1027468.384	1878282.521	686.560	-0.016	-0.079	-0.140	
7	R7-3-B309	1027760.900	1878279.200	683.6	1027760.946	1878279.255	683.579	.046	0.055	-0.021	
7	R7-3-B31	1026864.000	1878851.300	685.1	1026864.033	1878851.295	685.032	.033	-0.005	-0.068	
7	R7-3-B310	1027719.800	1878276.100	687.1	1027719.809	1878276.121	686.873	.009	0.021	-0.227	
7	R7-3-B311	1027823.500	1878274.100	683	1027823.498	1878274.027	682.958	-0.002	-0.073	-0.042	
7	R7-3-B312	1027754.100	1878271.800	686.9	1027754.126	1878271.785	686.806	.026	-0.015	-0.094	
7	R7-3-B313	1027455.400	1878271.600	686.7	1027455.387	1878271.588	686.654	-0.013	-0.012	-0.046	
7	R7-3-B314	1027712.700	1878270.600	688	1027712.716	1878270.688	687.964	.016	0.088	-0.036	
7	R7-3-B315	1027829.400	1878268.800	683	1027829.411	1878268.791	682.966	.011	-0.009	-0.034	
7	R7-3-B316	1027578.700	1878267.300	687.5	1027578.740	1878267.292	687.268	.040	-0.008	-0.232	
7	R7-3-B317	1027758.700	1878263.800	686.9	1027758.714	1878263.761	686.657	.014	-0.039	-0.243	
7	R7-3-B318	1027467.000	1878256.600	686.4	1027467.031	1878256.606	686.351	.031	0.006	-0.049	
7	R7-3-B319	1027837.000	1878255.200	682	1027836.978	1878255.196	681.964	-0.022	-0.004	-0.036	
7	R7-3-B32	1027051.100	1878849.000	682.8	1027051.064	1878848.980	682.673	-0.036	-0.020	-0.127	
7	R7-3-B320	1027770.300	1878252.100	683.5	1027770.334	1878252.093	683.457	.034	-0.007	-0.043	
7	R7-3-B321	1027736.600	1878250.400	685.9	1027736.524	1878250.462	685.749	-0.076	0.062	-0.151	
7	R7-3-B322	1027733.700	1878248.100	685.9	1027733.641	1878248.094	685.798	-0.059	-0.006	-0.102	
7	R7-3-B323	1027744.800	1878247.000	685.9	1027744.830	1878247.047	685.703	.030	0.047	-0.197	
7	R7-3-B324	1027842.800	1878242.100	682.4	1027842.761	1878242.154	682.180	-0.039	0.054	-0.220	
7	R7-3-B325	1027475.400	1878240.200	686.4	1027475.341	1878240.109	686.241	-0.059	-0.091	-0.159	
7	R7-3-B326	1027641.800	1878238.200	688.8	1027641.836	1878238.183	688.562	.036	-0.017	-0.238	
7	R7-3-B327	1027735.400	1878235.300	685.7	1027735.352	1878235.229	685.632	-0.048	-0.071	-0.068	
7	R7-3-B328	1027603.400	1878232.800	686.8	1027603.414	1878232.796	686.607	.014	-0.004	-0.193	
7	R7-3-B329	1027857.300	1878231.700	682.6	1027857.307	1878231.685	682.585	.007	-0.015	-0.015	
7	R7-3-B33	1026707.500	1878848.300	684.7	1026707.580	1878848.305	684.692	.080	0.005	-0.008	
7	R7-3-B330	1027760.800	1878221.900	687.3	1027760.765	1878221.987	687.245	-0.035	0.087	-0.055	
7	R7-3-B331	1027728.600	1878220.800	688.6	1027728.584	1878220.831	688.567	-0.016	0.031	-0.033	

Δ Elevation < -0.25 ft Blue

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Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-B332	1027660.800	1878219.600	686.9	1027660.856	1878219.521	686.705	0.056	-0.079	-0.195	
7	R7-3-B333	1027875.300	1878218.900	684.2	1027875.288	1878218.862	684.141	-0.012	-0.038	-0.059	
7	R7-3-B334	1027481.700	1878218.800	687.1	1027481.738	1878218.849	686.862	0.038	0.049	-0.238	
7	R7-3-B335	1027766.100	1878218.800	686	1027766.028	1878218.747	685.850	-0.072	-0.053	-0.150	
7	R7-3-B336	1027672.100	1878218.600	686.9	1027672.109	1878218.572	686.777	0.009	-0.028	-0.123	
7	R7-3-B337	1027760.200	1878216.300	687.2	1027760.122	1878216.251	687.125	-0.078	-0.049	-0.075	
7	R7-3-B338	1027693.400	1878215.600	687.5	1027693.436	1878215.644	687.298	0.036	0.044	-0.202	
7	R7-3-B339	1027767.900	1878213.300	685.2	1027767.888	1878213.293	685.066	-0.012	-0.007	-0.134	
7	R7-3-B34	1026948.900	1878848.300	687.3	1026948.843	1878848.348	687.269	-0.057	0.048	-0.031	
7	R7-3-B340	1027707.700	1878209.600	687.4	1027707.719	1878209.640	687.256	0.019	0.040	-0.144	
7	R7-3-B341	1027491.200	1878205.900	688.8	1027491.239	1878205.881	688.677	0.039	-0.019	-0.123	
7	R7-3-B342	1027879.200	1878204.800	684.2	1027879.158	1878204.816	684.039	-0.042	0.016	-0.161	
7	R7-3-B343	1027873.800	1878195.700	683.2	1027873.844	1878195.707	682.990	0.044	0.007	-0.210	
7	R7-3-B344	1027527.000	1878189.100	687.6	1027526.949	1878189.039	687.564	-0.051	-0.061	-0.036	
7	R7-3-B345	1027548.700	1878182.700	687	1027548.639	1878182.654	686.819	-0.061	-0.046	-0.181	
7	R7-3-B346	1027891.600	1878181.500	684	1027891.537	1878181.523	683.940	-0.063	0.023	-0.060	
7	R7-3-B347	1027555.900	1878180.000	687	1027555.938	1878180.010	686.891	0.038	0.010	-0.109	
7	R7-3-B348	1027534.400	1878179.800	688	1027534.456	1878179.711	687.956	0.056	-0.089	-0.044	
7	R7-3-B349	1027878.600	1878179.600	684	1027878.616	1878179.592	683.907	0.016	-0.008	-0.093	
7	R7-3-B35	1027073.600	1878844.900	686.5	1027073.630	1878844.934	686.493	0.030	0.034	-0.007	
7	R7-3-B350	1027898.100	1878176.000	683.7	1027898.087	1878175.955	683.642	-0.013	-0.045	-0.058	
7	R7-3-B351	1027557.000	1878172.100	687.9	1027556.929	1878172.064	687.663	-0.071	-0.036	-0.237	
7	R7-3-B352	1027548.900	1878163.200	687.9	1027548.982	1878163.183	687.775	0.082	-0.017	-0.125	
7	R7-3-B353	1027561.300	1878160.000	687.9	1027561.276	1878160.019	687.726	-0.024	0.019	-0.174	
7	R7-3-B354	1027550.000	1878159.100	687.9	1027549.989	1878159.102	687.838	-0.011	0.002	-0.062	
7	R7-3-B355	1027907.000	1878156.500	684.3	1027907.088	1878156.489	684.067	0.088	-0.011	-0.233	
7	R7-3-B356	1027574.400	1878152.300	688	1027574.323	1878152.329	687.846	-0.077	0.029	-0.154	
7	R7-3-B357	1027614.500	1878144.700	687	1027614.433	1878144.642	686.922	-0.067	-0.058	-0.078	
7	R7-3-B358	1027651.000	1878143.100	686.8	1027650.990	1878143.018	686.708	-0.010	-0.082	-0.092	
7	R7-3-B359	1027641.200	1878142.800	687	1027641.182	1878142.810	686.916	-0.018	0.010	-0.084	
7	R7-3-B36	1026954.100	1878840.900	687.3	1026954.187	1878840.947	687.107	0.087	0.047	-0.193	
7	R7-3-B360	1027636.400	1878137.400	687	1027636.390	1878137.326	686.753	-0.010	-0.074	-0.247	
7	R7-3-B361	1027908.300	1878135.400	684.3	1027908.320	1878135.417	684.132	0.020	0.017	-0.168	
7	R7-3-B362	1027685.900	1878133.600	686.2	1027685.959	1878133.647	686.098	0.059	0.047	-0.102	
7	R7-3-B363	1027724.900	1878125.400	686.7	1027724.881	1878125.461	686.546	-0.019	0.061	-0.154	
7	R7-3-B364	1027762.800	1878112.000	686.4	1027762.799	1878111.942	686.306	-0.001	-0.058	-0.094	
7	R7-3-B365	1027910.800	1878109.100	685	1027910.801	1878109.195	684.846	0.001	0.095	-0.154	

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-B366	1027774.200	1878099.600	686.4	1027774.121	1878099.550	686.178	-0.079	-0.050	-0.222	
7	R7-3-B367	1027920.400	1878097.800	685	1027920.351	1878097.768	684.759	-0.049	-0.032	-0.241	
7	R7-3-B368	1027789.700	1878094.400	687.9	1027789.782	1878094.364	687.878	0.082	-0.036	-0.022	
7	R7-3-B369	1027807.900	1878093.700	685.5	1027807.931	1878093.712	685.451	0.031	0.012	-0.049	
7	R7-3-B37	1026960.600	1878839.000	687.3	1026960.542	1878839.055	687.115	-0.058	0.055	-0.185	
7	R7-3-B370	1027901.000	1878092.800	684	1027901.082	1878092.791	683.768	0.082	-0.009	-0.232	
7	R7-3-B371	1027909.600	1878080.500	682.9	1027909.660	1878080.539	682.784	0.060	0.039	-0.116	
7	R7-3-B372	1027910.000	1878074.300	682.9	1027910.007	1878074.269	682.675	0.007	-0.031	-0.225	
7	R7-3-B373	1027825.500	1878067.100	683.1	1027825.574	1878067.050	682.884	0.074	-0.050	-0.216	
7	R7-3-B374	1027916.800	1878049.700	683.6	1027916.815	1878049.680	683.375	0.015	-0.020	-0.225	
7	R7-3-B375	1027842.300	1878041.800	683.1	1027842.304	1878041.842	682.989	0.004	0.042	-0.111	
7	R7-3-B376	1027934.100	1878016.600	683	1027934.179	1878016.651	682.901	0.079	0.051	-0.099	
7	R7-3-B377	1027861.000	1878010.700	683.3	1027860.954	1878010.720	683.087	-0.046	0.020	-0.213	
7	R7-3-B378	1027938.300	1878010.200	683.6	1027938.223	1878010.183	683.394	-0.077	-0.017	-0.206	
7	R7-3-B379	1027953.100	1878001.000	683.6	1027953.149	1878001.057	683.378	0.049	0.057	-0.222	
7	R7-3-B38	1026853.900	1878837.200	688	1026853.973	1878837.231	687.845	0.073	0.031	-0.155	
7	R7-3-B380	1027858.400	1877993.900	683.3	1027858.413	1877993.933	683.127	0.013	0.033	-0.173	
7	R7-3-B381	1027942.900	1877987.200	683.6	1027942.957	1877987.153	683.418	0.057	-0.047	-0.182	
7	R7-3-B382	1027849.900	1877973.100	687.7	1027849.869	1877973.038	687.474	-0.031	-0.062	-0.226	
7	R7-3-B383	1027955.100	1877958.400	683.2	1027955.166	1877958.489	683.008	0.066	0.089	-0.192	
7	R7-3-B384	1027872.600	1877947.500	683.3	1027872.512	1877947.510	683.069	-0.088	0.010	-0.231	
7	R7-3-B385	1027972.800	1877927.600	685	1027972.719	1877927.600	684.869	-0.081	0.000	-0.131	
7	R7-3-B386	1027868.700	1877914.200	684.4	1027868.665	1877914.266	684.175	-0.035	0.066	-0.225	
7	R7-3-B387	1027999.000	1877900.300	683.5	1027999.019	1877900.284	683.398	0.019	-0.016	-0.102	
7	R7-3-B388	1027880.200	1877883.900	688.1	1027880.169	1877883.863	687.868	-0.031	-0.037	-0.232	
7	R7-3-B389	1027895.500	1877881.800	685.1	1027895.544	1877881.767	684.862	0.044	-0.033	-0.238	
7	R7-3-B39	1026839.300	1878831.100	688	1026839.337	1878831.087	687.917	0.037	-0.013	-0.083	
7	R7-3-B390	1027877.400	1877879.800	688.1	1027877.361	1877879.875	687.976	-0.039	0.075	-0.124	
7	R7-3-B391	1027888.500	1877879.600	688.1	1027888.573	1877879.631	687.922	0.073	0.031	-0.178	
7	R7-3-B392	1027886.700	1877875.700	688.1	1027886.760	1877875.672	687.911	0.060	-0.028	-0.189	
7	R7-3-B393	1027908.800	1877874.400	685.1	1027908.838	1877874.373	684.977	0.038	-0.027	-0.123	
7	R7-3-B394	1028004.700	1877873.900	684	1028004.771	1877873.861	683.823	0.071	-0.039	-0.177	
7	R7-3-B395	1027901.500	1877871.600	685.1	1027901.460	1877871.550	684.887	-0.040	-0.050	-0.213	
7	R7-3-B396	1027922.400	1877860.600	682.4	1027922.335	1877860.549	682.307	-0.065	-0.051	-0.093	
7	R7-3-B397	1027917.900	1877855.500	686.4	1027917.953	1877855.540	686.233	0.053	0.040	-0.167	
7	R7-3-B398	1027911.200	1877850.700	686.4	1027911.178	1877850.707	686.297	-0.022	0.007	-0.103	
7	R7-3-B399	1028024.800	1877843.400	684.9	1028024.760	1877843.362	684.676	-0.040	-0.038	-0.224	

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KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-B4	1026754.800	1878902.100	687.5	1026754.786	1878902.112	687.282	-0.014	0.012	-0.218	
7	R7-3-B40	1026975.300	1878830.300	686.2	1026975.246	1878830.304	686.012	-0.054	0.004	-0.188	
7	R7-3-B400	1027926.300	1877841.900	686.4	1027926.301	1877841.891	686.157	0.001	-0.009	-0.243	
7	R7-3-B401	1028020.900	1877836.700	684.9	1028020.818	1877836.697	684.665	-0.082	-0.003	-0.235	
7	R7-3-B402	1027941.400	1877835.300	684.6	1027941.336	1877835.285	684.371	-0.064	-0.015	-0.229	
7	R7-3-B403	1028020.900	1877831.000	684.9	1028020.816	1877830.952	684.676	-0.084	-0.048	-0.224	
7	R7-3-B404	1028024.800	1877817.400	683.4	1028024.778	1877817.404	683.315	-0.022	0.004	-0.085	
7	R7-3-B405	1027954.700	1877814.400	684.4	1027954.644	1877814.440	684.268	-0.056	0.040	-0.132	
7	R7-3-B406	1028030.300	1877810.200	683.4	1028030.342	1877810.214	683.167	0.042	0.014	-0.233	
7	R7-3-B407	1027959.600	1877804.400	684.4	1027959.599	1877804.471	684.237	-0.001	0.071	-0.163	
7	R7-3-B408	1028037.300	1877782.800	681.3	1028037.220	1877782.772	681.141	-0.080	-0.028	-0.159	
7	R7-3-B409	1027966.300	1877782.600	685.3	1027966.305	1877782.680	685.153	0.005	0.080	-0.147	
7	R7-3-B41	1027088.100	1878829.800	686.5	1027088.103	1878829.774	686.302	0.003	-0.026	-0.198	
7	R7-3-B410	1028022.100	1877774.700	681.3	1028022.111	1877774.628	681.223	0.011	-0.072	-0.077	
7	R7-3-B411	1027967.000	1877769.000	685.3	1027966.999	1877769.066	685.215	-0.001	0.066	-0.085	
7	R7-3-B412	1028013.600	1877755.800	685.7	1028013.667	1877755.805	685.494	0.067	0.005	-0.206	
7	R7-3-B413	1028044.900	1877751.700	685.2	1028044.882	1877751.739	685.072	-0.018	0.039	-0.128	
7	R7-3-B414	1027968.700	1877749.300	685.5	1027968.776	1877749.260	685.415	0.076	-0.040	-0.085	
7	R7-3-B415	1028028.100	1877749.200	685.8	1028028.065	1877749.231	685.562	-0.035	0.031	-0.238	
7	R7-3-B416	1028052.600	1877747.200	685.2	1028052.513	1877747.185	684.989	-0.087	-0.015	-0.211	
7	R7-3-B417	1027961.900	1877744.500	686.1	1027961.885	1877744.534	685.874	-0.015	0.034	-0.226	
7	R7-3-B418	1028005.300	1877742.000	685.7	1028005.236	1877742.016	685.632	-0.064	0.016	-0.068	
7	R7-3-B419	1028061.800	1877740.600	685.2	1028061.788	1877740.628	684.996	-0.012	0.028	-0.204	
7	R7-3-B42	1026989.900	1878827.600	684.9	1026989.972	1878827.561	684.777	0.072	-0.039	-0.123	
7	R7-3-B420	1027991.600	1877740.000	681.9	1027991.656	1877740.058	681.827	0.056	0.058	-0.073	
7	R7-3-B421	1027992.300	1877731.400	684.5	1027992.320	1877731.370	684.301	0.020	-0.030	-0.199	
7	R7-3-B422	1028040.700	1877728.100	685.8	1028040.644	1877728.033	685.684	-0.056	-0.067	-0.116	
7	R7-3-B423	1028014.500	1877726.900	686.3	1028014.556	1877726.900	686.152	0.056	0.000	-0.148	
7	R7-3-B424	1027957.900	1877724.500	683.9	1027957.942	1877724.455	683.708	0.042	-0.045	-0.192	
7	R7-3-B425	1027990.000	1877722.600	684.5	1027989.977	1877722.643	684.353	-0.023	0.043	-0.147	
7	R7-3-B426	1028035.500	1877719.800	686.3	1028035.497	1877719.752	686.184	-0.003	-0.048	-0.116	
7	R7-3-B427	1028015.200	1877718.400	686.3	1028015.248	1877718.427	686.071	0.048	0.027	-0.229	
7	R7-3-B428	1027959.800	1877718.200	683.9	1027959.840	1877718.231	683.858	0.040	0.031	-0.042	
7	R7-3-B429	1027972.800	1877712.700	683.9	1027972.765	1877712.690	683.851	-0.035	-0.010	-0.049	
7	R7-3-B43	1026696.500	1878825.800	683.9	1026696.427	1878825.772	683.827	-0.073	-0.028	-0.073	
7	R7-3-B430	1027962.800	1877711.700	683.9	1027962.759	1877711.707	683.808	-0.041	0.007	-0.092	
7	R7-3-B431	1028023.800	1877708.000	686.3	1028023.824	1877708.007	686.133	0.024	0.007	-0.167	

Δ Elevation < -0.25 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-B44	1026826.100	1878824.800	684.4	1026826.055	1878824.792	684.328	-0.045	-0.008	-0.072	
7	R7-3-B45	1026680.600	1878824.200	684.7	1026680.664	1878824.257	684.594	0.064	0.057	-0.106	
7	R7-3-B46	1027115.700	1878814.100	685.4	1027115.702	1878814.159	685.304	0.002	0.059	-0.096	
7	R7-3-B47	1026673.800	1878811.400	684.3	1026673.725	1878811.379	684.268	-0.075	-0.021	-0.032	
7	R7-3-B48	1026813.100	1878803.800	685	1026813.089	1878803.748	684.948	-0.011	-0.052	-0.052	
7	R7-3-B49	1027151.100	1878803.500	683.5	1027151.075	1878803.450	683.467	-0.025	-0.050	-0.033	
7	R7-3-B5	1026934.400	1878900.500	685.2	1026934.474	1878900.464	684.953	0.074	-0.036	-0.247	
7	R7-3-B50	1026663.900	1878796.500	682.9	1026663.836	1878796.441	682.658	-0.064	-0.059	-0.242	
7	R7-3-B51	1026654.600	1878796.000	686.5	1026654.639	1878795.962	686.472	0.039	-0.038	-0.028	
7	R7-3-B52	1027011.200	1878795.300	689.3	1027011.142	1878795.300	689.223	-0.058	0.000	-0.077	
7	R7-3-B53	1026640.400	1878788.200	686.5	1026640.457	1878788.147	686.446	0.057	-0.053	-0.054	
7	R7-3-B54	1027183.800	1878787.300	684.5	1027183.731	1878787.349	684.497	-0.069	0.049	-0.003	
7	R7-3-B55	1027041.200	1878780.300	687.6	1027041.184	1878780.363	687.438	-0.016	0.063	-0.162	
7	R7-3-B56	1026788.700	1878780.200	687	1026788.644	1878780.233	686.932	-0.056	0.033	-0.068	
7	R7-3-B57	1026611.500	1878779.300	687.5	1026611.421	1878779.338	687.390	-0.079	0.038	-0.110	
7	R7-3-B58	1026800.500	1878778.300	687	1026800.508	1878778.227	686.980	0.008	-0.073	-0.020	
7	R7-3-B59	1026627.800	1878777.600	686.1	1026627.841	1878777.620	685.963	0.041	0.020	-0.137	
7	R7-3-B6	1026772.100	1878900.300	687.5	1026772.094	1878900.347	687.368	-0.006	0.047	-0.132	
7	R7-3-B60	1027203.300	1878776.400	683.8	1027203.364	1878776.407	683.754	0.064	0.007	-0.046	
7	R7-3-B61	1026588.300	1878776.100	686.6	1026588.209	1878776.125	686.588	-0.091	0.025	-0.012	
7	R7-3-B62	1026598.700	1878774.900	687.1	1026598.664	1878774.895	687.077	-0.036	-0.005	-0.023	
7	R7-3-B63	1027069.500	1878770.800	688.2	1027069.506	1878770.859	688.188	0.006	0.059	-0.012	
7	R7-3-B64	1026585.100	1878770.500	686.6	1026585.068	1878770.498	686.448	-0.032	-0.002	-0.152	
7	R7-3-B65	1026764.800	1878769.300	684.2	1026764.734	1878769.319	684.154	-0.066	0.019	-0.046	
7	R7-3-B66	1027233.300	1878765.800	684.6	1027233.274	1878765.753	684.551	-0.026	-0.047	-0.049	
7	R7-3-B67	1026589.000	1878764.700	686.6	1026588.987	1878764.755	686.581	-0.013	0.055	-0.019	
7	R7-3-B68	1027092.900	1878762.900	688.2	1027092.953	1878762.911	688.085	0.053	0.011	-0.115	
7	R7-3-B69	1026756.600	1878755.500	684.2	1026756.568	1878755.502	684.127	-0.032	0.002	-0.073	
7	R7-3-B7	1026879.500	1878899.400	684.2	1026879.536	1878899.395	684.099	0.036	-0.005	-0.101	
7	R7-3-B70	1027248.600	1878755.100	684.6	1027248.526	1878755.082	684.561	-0.074	-0.018	-0.039	
7	R7-3-B71	1027121.800	1878754.000	685.2	1027121.797	1878753.938	685.159	-0.003	-0.062	-0.041	
7	R7-3-B72	1026591.800	1878751.600	682.7	1026591.813	1878751.605	682.677	0.013	0.005	-0.023	
7	R7-3-B73	1027266.900	1878746.900	684	1027266.844	1878746.908	683.963	-0.056	0.008	-0.037	
7	R7-3-B74	1027147.800	1878741.300	684	1027147.719	1878741.293	683.976	-0.081	-0.007	-0.024	
7	R7-3-B75	1026619.300	1878739.700	684.6	1026619.389	1878739.658	684.574	0.089	-0.042	-0.026	
7	R7-3-B76	1026610.400	1878738.900	683.4	1026610.444	1878738.962	683.324	0.044	0.062	-0.076	
7	R7-3-B77	1026742.500	1878735.600	685.1	1026742.461	1878735.605	685.013	-0.039	0.005	-0.087	

Δ Elevation < -0.25 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach 7-3

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
7	R7-3-B78	1026634.000	1878734.200	684.6	1026634.014	1878734.262	684.589	0.014	0.062	-0.011	
7	R7-3-B79	1026596.400	1878734.100	683.3	1026596.448	1878734.105	683.174	0.048	0.005	-0.126	
7	R7-3-B8	1026770.400	1878894.900	687.5	1026770.371	1878894.954	687.262	-0.029	0.054	-0.238	
7	R7-3-B80	1026608.200	1878733.400	683.3	1026608.296	1878733.406	683.100	0.096	0.006	-0.200	
7	R7-3-B81	1027291.100	1878730.200	683.6	1027291.153	1878730.220	683.550	0.053	0.020	-0.050	
7	R7-3-B82	1026612.700	1878725.900	683.7	1026612.673	1878725.834	683.553	-0.027	-0.066	-0.147	
7	R7-3-B83	1026745.900	1878725.800	685.8	1026745.844	1878725.803	685.743	-0.056	0.003	-0.057	
7	R7-3-B84	1026599.600	1878725.100	683.9	1026599.614	1878725.062	683.896	0.014	-0.038	-0.004	
7	R7-3-B85	1026630.600	1878722.600	685.2	1026630.608	1878722.644	685.040	0.008	0.044	-0.160	
7	R7-3-B86	1027170.300	1878722.300	687.7	1027170.325	1878722.326	687.658	0.025	0.026	-0.042	
7	R7-3-B87	1026592.500	1878710.600	683	1026592.476	1878710.503	682.807	-0.024	-0.097	-0.193	
7	R7-3-B88	1027309.500	1878710.200	683.2	1027309.390	1878710.255	683.112	-0.110	0.055	-0.088	
7	R7-3-B89	1027273.500	1878705.800	682.5	1027273.488	1878705.752	682.482	-0.012	-0.048	-0.018	
7	R7-3-B9	1026973.700	1878893.200	683.6	1026973.615	1878893.173	683.444	-0.085	-0.027	-0.156	
7	R7-3-B90	1027206.100	1878705.200	688.1	1027206.056	1878705.210	688.086	-0.044	0.010	-0.014	
7	R7-3-B91	1026752.200	1878703.300	684.9	1026752.202	1878703.324	684.864	0.002	0.024	-0.036	
7	R7-3-B92	1027264.200	1878703.100	683.3	1027264.206	1878703.137	683.251	0.006	0.037	-0.049	
7	R7-3-B93	1027287.300	1878701.500	683.3	1027287.313	1878701.487	683.264	0.013	-0.013	-0.036	
7	R7-3-B94	1026596.600	1878700.600	683	1026596.573	1878700.655	682.989	-0.027	0.055	-0.011	
7	R7-3-B95	1027269.600	1878698.200	683.3	1027269.694	1878698.129	683.244	0.094	-0.071	-0.056	
7	R7-3-B96	1026754.300	1878696.300	684.9	1026754.297	1878696.301	684.779	-0.003	0.001	-0.121	
7	R7-3-B97	1027321.000	1878694.900	683.6	1027321.045	1878694.929	683.547	0.045	0.029	-0.053	
7	R7-3-B98	1027233.800	1878694.200	688	1027233.796	1878694.152	687.979	-0.004	-0.048	-0.021	
7	R7-3-B99	1027263.000	1878690.400	685.6	1027262.977	1878690.357	685.490	-0.023	-0.043	-0.110	

Δ Elevation < -0.25 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS
Bottom of Targeted Material
Reach 8-1

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation	
8	R8-1-12868b	1028059.400	1877472.200	686.9	1028059.353	1877472.234	686.784	-0.047	0.034	-0.116	
8	R8-1-12869b	1028051.300	1877472.700	687.4	1028051.254	1877472.666	687.165	-0.046	-0.034	-0.235	
8	R8-1-12873b	1028050.800	1877465.200	686.8	1028050.740	1877465.239	686.714	-0.060	0.039	-0.086	
8	R8-1-B1	1028051.900	1877476.600	687.4	1028051.911	1877476.532	687.298	0.011	-0.068	-0.102	
8	R8-1-B2	1028060.100	1877476.600	686.9	1028060.078	1877476.546	686.781	-0.022	-0.054	-0.119	
8	R8-1-B3	1028063.700	1877472.800	686.9	1028063.658	1877472.742	686.650	-0.042	-0.058	-0.250	
8	R8-1-B4	1028047.700	1877472.400	687.4	1028047.739	1877472.372	687.355	0.039	-0.028	-0.045	
8	R8-1-B5	1028062.000	1877470.400	686.9	1028061.928	1877470.395	686.687	-0.072	-0.005	-0.213	
8	R8-1-B6	1028047.400	1877464.700	686.8	1028047.340	1877464.735	686.686	-0.060	0.035	-0.114	
8	R8-1-B7	1028054.700	1877464.600	686.8	1028054.785	1877464.586	686.798	0.085	-0.014	-0.002	
8	R8-1-B8	1028048.500	1877461.700	686.8	1028048.479	1877461.727	686.230	-0.021	0.027	-0.570	Point was surveyed at existing ground surface
8	R8-1-B9	1028051.300	1877461.000	686.8	1028051.222	1877460.998	685.614	-0.078	-0.002	-1.186	Point was surveyed at existing ground surface

Δ Elevation < -0.25 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red

KRESS CREEK / WEST BRANCH DUPAGE RIVER VERIFICATION POINTS

Bottom of Targeted Material

Reach R8-2

DESIGN					ACTUAL			DATA COMPARISON			COMMENTS		
Area	Name	Easting	Northing	Elevation	Easting	Northing	Elevation	Δ Easting	Δ Northing	Δ Elevation			
8	R8-2-12848b	1028212.800	1877457.600	687	1028212.779	1877457.525	686.986	-0.021	-0.075	-0.014			
8	R8-2-12849b	1028220.100	1877457.800	686.6	1028220.017	1877457.835	686.473	-0.083	0.035	-0.127			
8	R8-2-12858b	1028212.400	1877466.200	686.5	1028212.398	1877466.270	686.445	-0.002	0.070	-0.055			
8	R8-2-12861b	1028212.000	1877449.200	686.4	1028211.949	1877449.266	686.378	-0.051	0.066	-0.022			
8	R8-2-B1	1028212.300	1877469.800	686.5	1028212.353	1877469.773	686.401	0.053	-0.027	-0.099			
8	R8-2-B10	1028208.700	1877457.300	687	1028208.689	1877457.276	686.918	-0.011	-0.024	-0.082			
8	R8-2-B11	1028220.000	1877453.800	686.6	1028220.063	1877453.764	686.588	0.063	-0.036	-0.012			
8	R8-2-B12	1028216.300	1877453.700	687	1028216.310	1877453.621	686.787	0.010	-0.079	-0.213			
8	R8-2-B13	1028224.000	1877453.700	686.6	1028223.941	1877453.646	686.479	-0.059	-0.054	-0.121			
8	R8-2-B14	1028215.900	1877449.500	686.4	1028215.942	1877449.546	686.369	0.042	0.046	-0.031			
8	R8-2-B15	1028208.700	1877449.200	686.4	1028208.705	1877449.124	686.372	0.005	-0.076	-0.028			
8	R8-2-B16	1028208.700	1877445.100	686.4	1028208.614	1877445.127	686.392	-0.086	0.027	-0.008			
8	R8-2-B17	1028212.000	1877445.100	686.4	1028211.967	1877445.066	686.284	-0.033	-0.034	-0.116			
8	R8-2-B18	1028216.000	1877445.100	686.4	1028215.960	1877445.029	686.254	-0.040	-0.071	-0.146			
8	R8-2-B2	1028208.600	1877469.700	686.5	1028208.647	1877469.706	686.414	0.047	0.006	-0.086			
8	R8-2-B3	1028216.100	1877469.700	686.5	1028216.087	1877469.669	686.391	-0.013	-0.031	-0.109			
8	R8-2-B4	1028216.300	1877466.000	686.5	1028216.340	1877466.000	686.472	0.040	0.000	-0.028			
8	R8-2-B5	1028209.100	1877465.700	686.5	1028209.182	1877465.719	686.464	0.082	0.019	-0.036			
8	R8-2-B6	1028220.100	1877461.800	686.6	1028220.142	1877461.761	686.587	0.042	-0.039	-0.013			
8	R8-2-B7	1028224.100	1877461.800	686.6	1028224.017	1877461.747	686.405	-0.083	-0.053	-0.195			
8	R8-2-B8	1028216.500	1877461.700	686.6	1028216.502	1877461.784	686.502	0.002	0.084	-0.098			
8	R8-2-B9	1028224.100	1877457.600	686.6	1028224.075	1877457.547	686.551	-0.025	-0.053	-0.049			

Δ Elevation < -0.25 ft Blue

Δ Easting/Northing < or = 0.2 ft Green

Δ Elevation -0.25 to 0.0 ft Green

Δ Easting/Northing > 0.2 ft Blue

Δ Elevation > 0.0 ft Red



Appendix G

Sampling Data Reusable Overburden
for Reach 7 (on attached CD)



Infrastructure, environment, buildings

Transmittal Letter

To:
Glen Anderson, Construction manager
Tronox
800 Weyrauch Street
West Chicago, IL 60185

Copies:
Heather VanDewalker, ARCADIS
Marty Folan, Sevenson

ARCADIS
800 Weyrauch Street
West Chicago
Illinois 60185
Tel 630.293.7695, Ext. 11
Fax 630.293.7719

KC 180

From:
Michael Savage

Date:
September 2, 2010

Subject:
Kress Creek/West Branch Remedial Action
Project – Reach 7

ARCADIS Project No.:
B0071034.0000

We are sending you:
 Attached

Under Separate Cover Via _____ the Following Items:

- | | | | |
|--|----------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Shop Drawings | <input type="checkbox"/> Plans | <input type="checkbox"/> Specifications | <input type="checkbox"/> Change Order |
| <input type="checkbox"/> Prints | <input type="checkbox"/> Samples | <input type="checkbox"/> Copy of Letter | <input type="checkbox"/> Reports |
| <input checked="" type="checkbox"/> Other: Reach 7 Overburden Lift Radiological Sample Results | | | |

Copies	Date	Drawing No.	Rev.	Description	Action*
Reach 7 – Overburden Lift Sample Results					
1	08/31/2010	Pile # KC-R7-OB1		KC-R7-OB1-A through KC-R7-OB1-F (and one QCF sample)	F
1	08/31/2010	Pile # KC-R7-OB2		KC-R7-OB2-A through KC-R7-OB2-F (and one QCF sample)	F
1	09/02/2010	Pile # KC-R7-OB3		KC-R7-OB3-A through KC-R7-OB3-F (and one QCF sample)	F
1	09/02/2010	N/A		Reach 7 Overburden Piles Tracking Spreadsheet for 2010	F

Action*

- | | | |
|---|--|--|
| <input type="checkbox"/> A Approved | <input type="checkbox"/> CR Correct and Resubmit | <input type="checkbox"/> Resubmit _____ Copies |
| <input type="checkbox"/> AN Approved As Noted | <input checked="" type="checkbox"/> F File | <input type="checkbox"/> Return _____ Copies |
| <input type="checkbox"/> AS As Requested | <input type="checkbox"/> FA For Approval | <input type="checkbox"/> Review and Comment |
| <input type="checkbox"/> Other: _____ | | |

Mailing Method

- | | | | |
|--|---|---|---|
| <input type="checkbox"/> U.S. Postal Service 1 st Class | <input checked="" type="checkbox"/> Courier/Hand Delivery | <input type="checkbox"/> FedEx Priority Overnight | <input type="checkbox"/> FedEx 2-Day Delivery |
| <input type="checkbox"/> Certified/Registered Mail | <input type="checkbox"/> United Parcel Service (UPS) | <input type="checkbox"/> FedEx Standard Overnight | <input type="checkbox"/> FedEx Economy |
| <input type="checkbox"/> Other: _____ | | | |

Comments: _____

Savage, Michael

From: Fischer.Timothy@epamail.epa.gov
Sent: Thursday, September 23, 2010 4:55 PM
To: Savage, Michael
Cc: glen.anderson@tronox.com
Subject: Fw: Overburden Lift #KC-R7-082010-OB-1A Verification
Attachments: Lift 1A verification email.pdf; KC-R7-082010-OB-1A_1041.pdf

Mike,

Please find the verification information for OB lift #KC-R7-082010-OB-1A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 09/23/2010 04:53 PM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: <Fischer.Timothy@epamail.epa.gov>
Cc: "Runyon, Tim" <Tim.Runyon@illinois.gov>
Date: 09/23/2010 02:28 PM
Subject: Overburden Lift #KC-R7-082010-OB-1A Verification

Here is a PDF of the 1A email and analysis sheet. You should have them all now.

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

Shafer, Steve

From: Shafer, Steve
Sent: Friday, August 27, 2010 8:04 AM
To: Runyon, Tim; 'Fischer.Timothy@epamail.epa.gov'
Subject: Overburden Lift #KC-R7-082010-OB-1A Verification

On 8/20/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-082010-OB-1A which was laid out in the West Overburden Lay-down area. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level). The lift was highly saturated and was in reality 12" to 18" thick. Because of the high moisture content and the nature of the material it was determined by the Steve Shafer (VTL) that it would not be advantages to try and get the contractor to remove the material to get it to a 6" lift and also there was no bermed area constructed at that time where it could be contained if the material was removed. In addition the VTL explained to the construction contractor (SES) that IEMA would not perform another verification survey of a lift that is laid out with a lift thickness greater than 6". Due to the thickness and the nature of the material it took REM, LLC personnel nearly 4 hour to perform the gamma walkover survey. The material lift area was approximately 50' wide by 200' long. The 11 samples were collected which included 1 duplicate which were submitted to the WCL on 8/20/10 at 14:05 hrs under COC #1-1041. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-009.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 4235 cpm
Gamma Count Rate Range : 2830 – 6037 cpm
Gamma Count Rate STD DEV : 584 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 8/26/10)(*)

Sample concentration Average: 4.93 pCi/g
Sample concentration Range : 3.54 – 6.10 pCi/g

(*) – 2 samples were required by procedure to be dried overnight.

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

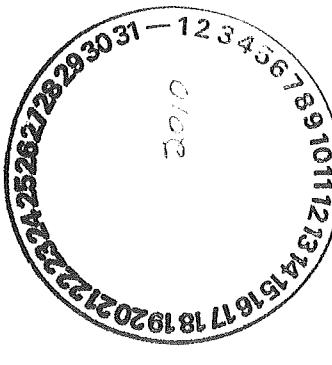
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Parcel Number:	11041	Kress Creek Reach 7 Overburden Lift #KCR7-082010-OB-1A (West Area); COC# 1-1041, August 20, 2010	Tl-208	Bi-212	Ac-228	Bi-214	Pb-214	Bi-214	Pb-214	Bi-214	Ra-228	Ra-226	TOTAL	
Sample I.D.	Grid #	Sample Point	Result	Error	Result									
104018dry	1-W	COMPOSITE	3.29	0.28	3.79	0.61	4.33	0.20	0.85	0.10	0.89	0.10	3.97	0.87
104019	2-W	COMPOSITE	3.78	0.34	3.99	0.73	4.23	0.21	1.06	0.11	0.93	0.11	4.09	0.99
104020	3-W	COMPOSITE	3.22	0.29	3.26	0.60	3.62	0.18	0.73	0.08	0.71	0.09	3.49	0.72
104021	4-W	COMPOSITE	3.18	0.28	3.61	0.64	3.52	0.18	0.59	0.08	0.69	0.09	3.44	0.64
104022	5-W	COMPOSITE	2.76	0.15	2.99	0.22	2.94	0.07	0.62	0.03	0.63	0.04	2.92	0.62
104023	6-W	COMPOSITE	3.65	0.32	3.52	0.59	4.09	0.20	0.78	0.10	0.70	0.09	3.93	0.74
104024	7-W	COMPOSITE	4.84	0.41	5.10	0.77	5.37	0.25	0.89	0.11	0.85	0.11	5.22	0.87
104026	8-W	COMPOSITE	4.21	0.36	4.05	0.72	5.01	0.23	0.86	0.10	0.83	0.11	4.73	0.84
104027	9-W	COMPOSITE	4.10	0.37	4.22	0.68	4.48	0.22	0.92	0.10	0.91	0.10	4.37	0.91
104027	9-W	COMPOSITE	4.10	0.37	4.22	0.68	4.48	0.22	0.92	0.10	0.91	0.10	4.37	0.91
104028dry	10-W	COMPOSITE	4.17	0.35	3.84	0.64	5.31	0.22	0.70	0.10	0.71	0.09	4.88	0.71

**INFORMATION
ONLY**

Lift Average

4.93



COPY

Stephen Blodgett

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 8/20/2010

PILE #: **KC-R7-OB1** Est. Volume of Pile in Cubic Yards: 540

Number of Samples
Required Per SOP 214:
6

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	Std. Dev. for the analyses of the duplicate sample	S_{dup}
KC-R7-OB1-A	3.71					
KC-R7-OB1-B	3.62					
KC-R7-OB1-C	2.00					
KC-R7-OB1-D	3.62					
KC-R7-OB1-E	5.09					
KC-R7-OB1-F	5.71					
KC-R7-OB1-G (QCF)						
Number of Samples (n)	<u>6</u>					
Average (Mean of the sample population) (X bar)	<u>3.96</u>					
Standard Deviation of sample population (S_1)	<u>1.19</u>					
U_α (True Mean) = $(X \text{ bar}) + (t^* (S_1 / \sqrt{n}))$ Where " t^* " is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	<u>4.94</u>	$t^* \text{ value}$ <u>2.015</u>				
Release Criteria			<u>7.20</u>			

$U_\alpha < \text{Release Criteria?}$

6

$S_{dup} = \sqrt{(S_1^2 + S_2^2)} =$
1.24

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in
SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_1)	<u>1.19</u>	$t^* \text{ value}$ <u>2.015</u>	U_α (True Mean) = $(X \text{ bar}) + (t^* (S_1 / \sqrt{n}))$ Where " t^* " is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	$3 \times S_{dup} =$ <u>3.71</u>	$\text{Mean} + 3 S_{dup} =$ <u>7.66</u>	$QC < (\text{Mean} + 3 S_{dup})?$ <u>O.K.</u>
Release Criteria				$\text{Mean} - 3 S_{dup} =$ <u>0.25</u>	$QC > (\text{Mean} - 3 S_{dup})?$ <u>O.K.</u>	

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
AS ONSITE BACKFILL PER SOP-214

Douglas Johnson 8-26-10 / Michael F. Savell 8/31/10

Name/date
John Johnson 8-31-10
Name/date
Michael F. Savell 8/31/10

REVIEWED: SES/ARCADIS

APPROVED: OFFSITES MANAGER:

Kotwicki, Joseph

From: Savage, Michael
Sent: Friday, September 24, 2010 11:35 AM
To: Kotwicki, Joseph
Subject: FW: Overburden Lift #KC-R7-082510-OB-2A Verification
Attachments: KC-R7-082510-OB-2A_1040.pdf

For your use in compiling the overburden pile data packages.

From: Fischer.Timothy@epamail.epa.gov [mailto:Fischer.Timothy@epamail.epa.gov]
Sent: Thursday, September 23, 2010 4:56 PM
To: Savage, Michael
Cc: glen.anderson@tronox.com
Subject: Fw: Overburden Lift #KC-R7-082510-OB-2A Verification

Mike,

Please find the verification information for OB lift #KC-R7-082510-OB-2A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 09/23/2010 04:55 PM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: <Fischer.Timothy@epamail.epa.gov>
Cc: "Runyon, Tim" <Tim.Runyon@illinois.gov>
Date: 09/23/2010 01:58 PM
Subject: FW: Overburden Lift #KC-R7-082510-OB-2A Verification

Tim, delete the previous 2A email that I forwarded to you. I renamed and attached the wrong Spreadsheet. That was the 1A sheet. Attached is the correct sheet.

From: Shafer, Steve
Sent: Monday, August 30, 2010 6:10 PM
To: Runyon, Tim; 'Fischer.Timothy@epamail.epa.gov'
Subject: Overburden Lift #KC-R7-082510-OB-2A Verification

On 8/23/10 and 8/25/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-082510-OB-2A which was laid out in the West Overburden Lay-down area. Lift 2A was surveyed half at a time for ease of walking through the materials. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 8/25/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover surveys were performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 Nal(TL) detector. The total east and west material lift area was approximately 50' wide by 200' long. 11 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 8/25/10 at 11:05 hrs under COC #1-1040. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-012. If you should have any

questions please do not hesitate to call me.

Gamma Verification Survey Summary (West Half)

Gamma Count Rate Average) : 3498 cpm
Gamma Count Rate Range : 1773 – 4615 cpm
Gamma Count Rate STD DEV : 516 cpm

Gamma Verification Survey Summary (East Half)

Gamma Count Rate Average) : 3517 cpm
Gamma Count Rate Range : 2164 – 4159 cpm
Gamma Count Rate STD DEV : 265 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 8/30/10)

Sample concentration Average: 3.10 pCi/g
Sample concentration Range : 2.13 – 3.96 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

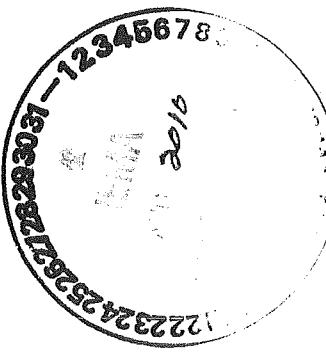
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Parcel Number:	11040	Kress Creek Reach 7 Overburden Lift #KC-R7-082510-OB-2A (East Area): COC# 1-1040 August 25, 2010	Bi-212	Ac-228	Pb-214												
Sample I.D.	Grid #	Sample Point	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Total
104029	1-E	COMPOSITE	2.74	0.25	2.39	0.54	3.14	0.15	0.51	0.06	0.45	0.07	3.00	0.48	3.48		
104030	2-E	COMPOSITE	1.83	0.18	2.07	0.47	2.15	0.12	0.43	0.06	0.41	0.06	2.05	0.42	2.47		
104031	3-E	COMPOSITE	1.46	0.15	1.67	0.35	1.61	0.10	0.54	0.06	0.59	0.06	1.57	0.56	2.13		
104032	4-E	COMPOSITE	1.97	0.19	2.13	0.45	2.53	0.13	0.54	0.07	0.52	0.06	2.33	0.53	2.86		
104033	5-E	COMPOSITE	2.46	0.21	2.46	0.48	2.63	0.13	0.68	0.07	0.60	0.07	2.57	0.64	3.21		
104034	6-E	COMPOSITE	1.34	0.14	1.61	0.39	1.57	0.10	0.75	0.07	0.63	0.07	1.50	0.69	2.18		
104036	7-E	COMPOSITE	2.59	0.24	2.72	0.51	2.78	0.15	0.85	0.08	0.81	0.09	2.72	0.83	3.55		
104037	8-E	COMPOSITE	2.78	0.26	2.64	0.56	3.14	0.17	1.05	0.09	0.86	0.10	3.00	0.96	3.96		
104038	9-E	COMPOSITE	2.48	0.24	2.36	0.65	2.87	0.16	0.84	0.09	0.73	0.08	2.73	0.78	3.51		
104039	10-E	COMPOSITE	2.52	0.23	3.15	0.59	2.95	0.16	0.75	0.09	0.81	0.08	2.83	0.78	3.62		

**INFORMATION
ONLY**

Lift Average

3.10



COPY

Stephanie Babb

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 8/24/2010
PILE # : KC-R7-OB2
Est. Volume of Pile in Cubic Yards: 180

Number of Samples
 Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB2-A	3.52				
KC-R7-OB2-B	2.17				
KC-R7-OB2-C	2.20				
KC-R7-OB2-D	3.30				
KC-R7-OB2-E	3.24				
KC-R7-OB2-F	3.10				
KC-R7-OB2-G (QCF)					
	3.39		0.31	0.15	0.23
Number of Samples (n)	<u>6</u>				
Average (Mean of the sample population) (X bar)	<u>2.92</u>				

Average of samples is <7.2 pCi/g, Proceed with Confidence Level Check described in
 SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_1)	0.54	t^* value	1.75
U_α (True Mean) = $(X \text{ bar}) + (t^* \cdot (S_1 / \sqrt{n}))$	3.36	2.075	4.67
Where " t^* " is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6			$QC < (Mean + 3S_{dup})?$ $QC > (Mean - 3S_{dup})?$
Release Criteria	7.20		O.K. O.K.
SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ONSITE BACKFILL PER SOP-214			

$U_\alpha < \text{Release Criteria?}$

REVIEWED: SES/ARCADIS

APPROVED: OFFSITES MANAGER:

Dan Schaefer 8-26-10 Michael F. Sandoff 8/31/10

Chris Johnson 8-31-10

Name/date

Kotwicki, Joseph

From: Savage, Michael
Sent: Friday, September 24, 2010 11:36 AM
To: Kotwicki, Joseph
Subject: FW: Overburden Lift #KC-R7-082810-OB-3A Verification
Attachments: KC-R7-082810-OB-3A_1042.pdf

For your use in compiling the overburden pile data packages.

From: Fischer.Timothy@epamail.epa.gov [mailto:Fischer.Timothy@epamail.epa.gov]
Sent: Thursday, September 23, 2010 4:57 PM
To: Savage, Michael
Cc: glen.anderson@tronox.com
Subject: Fw: Overburden Lift #KC-R7-082810-OB-3A Verification

Mike,

Please find the verification information for OB lift #KC-R7-082810-OB-3A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 09/23/2010 04:56 PM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: <Fischer.Timothy@epamail.epa.gov>
Cc: "Runyon, Tim" <Tim.Runyon@illinois.gov>
Date: 09/23/2010 01:47 PM
Subject: FW: Overburden Lift #KC-R7-082810-OB-3A Verification

From: Shafer, Steve
Sent: Wednesday, September 08, 2010 5:53 PM
To: 'Fischer.Timothy@epamail.epa.gov'; Runyon, Tim
Subject: Overburden Lift #KC-R7-082810-OB-3A Verification

On 8/28/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-082810-OB-3A which was laid out in the West Overburden Lay-down area. Lift 3A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 8/28/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 50' wide by 200' long. 11 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 8/28/10 at 15:00 hrs under COC #1-1042. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-015. During the GPS gamma walkover survey REM, LLC identified 2 elevated areas of activity that were greater than the 8,000 cpm action level which caused the verification to be suspended. The SES RSO was notified and

responded immediately to remediate the two areas. Elevated readings as high as 16,400 cpm were identified in grid #'s 6-W, 7-W, and 8-W. Approximately 9 yards of material was removed from the areas and the verification resumed. If you should have any questions please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 5541 cpm

Gamma Count Rate Range : 2749 – 9960 cpm (all areas >8000 cpm were remediated)

Gamma Count Rate STD DEV : 1484 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 9/7/10)

Sample concentration Average: 4.67 pCi/g

Sample concentration Range : 3.15 – 5.86 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

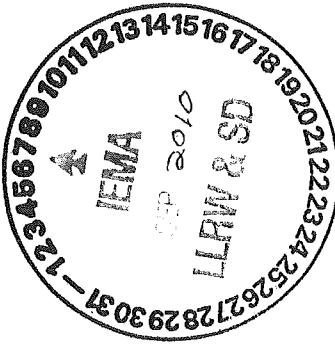
Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

Parcel Number:	Grid #	Sample Point	Result	Error	Ra-228	Ra-226	TOTAL								
104040	1-W	COMPOSITE	2.15	0.23	2.56	0.53	2.40	0.15	0.91	0.09	0.82	0.09	2.33	0.86	3.20
104041	2-W	COMPOSITE	2.57	0.25	2.46	0.51	2.82	0.16	0.64	0.09	0.66	0.09	2.72	0.65	3.38
104042	3-W	COMPOSITE	2.33	0.24	2.37	0.52	2.56	0.15	0.69	0.09	0.64	0.09	2.49	0.66	3.15
104043	4-W	COMPOSITE	3.99	0.32	4.63	0.71	4.52	0.20	0.52	0.08	0.54	0.08	4.38	0.53	4.91
104044	5-W	COMPOSITE	4.32	0.35	4.38	0.77	4.84	0.22	0.81	0.09	0.76	0.10	4.68	0.79	5.47
104046	6-W	COMPOSITE	4.76	0.39	5.40	0.73	5.05	0.22	0.56	0.08	0.60	0.09	5.01	0.58	5.59
104047	7-W	COMPOSITE	4.72	0.39	4.95	0.72	5.34	0.22	0.64	0.08	0.57	0.08	5.17	0.60	5.78
104048	8-W	COMPOSITE	4.08	0.35	4.33	0.66	4.65	0.20	0.62	0.09	0.57	0.08	4.49	0.59	5.08
104049	9-W	COMPOSITE	4.81	0.38	4.93	0.74	5.47	0.23	0.58	0.08	0.62	0.09	5.27	0.60	5.86
104050	10-W	COMPOSITE	3.50	0.30	4.21	0.57	3.89	0.18	0.48	0.07	0.53	0.07	3.81	0.50	4.31

INFORMATION
ONLY

Lift Average

4.67



COPY

Stephen E. Baker

OVERBURDEN PILE SAMPLING

Excavation Area: _____ Reach 7
 Date Sampled: _____ 8/27/2010

PILE #: KC-R7-OB3 Est. Volume of Pile in Cubic Yards: _____ 242

Number of Samples _____
 Required Per SOP 214: 5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	S_2	S_{dup}
KC-R7-OB3-A	3.78					
KC-R7-OB3-B	4.06					
KC-R7-OB3-C	4.71					
KC-R7-OB3-D	4.49					
KC-R7-OB3-E	2.25					
KC-R7-OB3-F	3.50					
KC-R7-OB3-G (QCF)			3.47	0.30	0.18	0.24
Number of Samples (n)	6					
Average (Mean of the sample population) (\bar{X} bar)	3.80					

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12

Check if QC Sample Dup. is within 3 Standard Deviations ($3 S_{dup}$) of the mean of the sample population, per SOP 214, paragraph 11.1	
$3 \times S_{dup} =$	2.51

$$\begin{aligned} \text{Mean} + 3 S_{dup} &= & 6.31 & \text{QC} < (\text{Mean} + 3 S_{dup})? & \text{O.K.} \\ \text{Mean} - 3 S_{dup} &= & 1.29 & \text{QC} > (\text{Mean} - 3 S_{dup})? & \text{O.K.} \end{aligned}$$

Standard Deviation of sample population (S_1)	0.80	"t" value	
U_α (True Mean) = $(\bar{X} \text{ bar}) + (t * (S_1 / \sqrt{n}))$	4.46	2.015	
Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6			

Release Criteria: 7.20

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ONSITE BACKFILL PER SOP-214

$U_\alpha < \text{Release Criteria?}$

Michael F. Savage 9/2/10

Michael F. Savage 9/2/10

Name/date

REVIEWED: SES/ARCADIS

APPROVED: OFFSITES MANAGER:



ARCADIS
800 Weyrauch Street
West Chicago
Illinois 60185
Tel 630.293.7695, Ext. 11
Fax 630.293.7719

Transmittal Letter

To:
Glen Anderson, Construction Manager
Tronox
800 Weyrauch Street
West Chicago, IL 60185

Copies:
Heather VanDewalker, ARCADIS
Marty Folan, Sevenson

KC 182

From:
Michael Savage *Michael F. Savage*
Subject:
Kress Creek/West Branch Remedial Action
Project – Reach 7

Date:
September 15, 2010

ARCADIS Project No.:
B0071034.0000

We are sending you:
 Attached

Under Separate Cover Via _____ the Following Items:

- | | | | |
|--|----------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Shop Drawings | <input type="checkbox"/> Plans | <input type="checkbox"/> Specifications | <input type="checkbox"/> Change Order |
| <input type="checkbox"/> Prints | <input type="checkbox"/> Samples | <input type="checkbox"/> Copy of Letter | <input type="checkbox"/> Reports |
| <input checked="" type="checkbox"/> Other: Reach 7 Overburden Lift Radiological Sample Results | | | |

Copies	Date	Drawing No.	Rev.	Description	Action*
		Reach 7		Reach 7 – Overburden Lift Sample Results	
1	09/15/2010	Pile # KC-R7-OB4		KC-R7-OB4-A through KC-R7-OB4-F (and one QC-E sample)	F
1	09/15/2010	Pile # KC-R7-OB5		KC-R7-OB5-A through KC-R7-OB5-E (and one QC-D sample)	F
1	09/05/2010	N/A		Reach 7 Overburden Piles Tracking Spreadsheet for 2010	F

Action*

- A Approved
 AN Approved As Noted
 AS As Requested
 Other: _____

- CR Correct and Resubmit
 F File
 FA For Approval

- Resubmit _____ Copies
 Return _____ Copies
 Review and Comment

Mailing Method

- U.S. Postal Service 1st Class Courier/Hand Delivery FedEx Priority Overnight FedEx 2-Day Delivery
 Certified/Registered Mail United Parcel Service (UPS) FedEx Standard Overnight FedEx Economy
 Other: _____

Comments: _____

Kotwicki, Joseph

From: Savage, Michael
Sent: Friday, September 24, 2010 11:37 AM
To: Kotwicki, Joseph
Subject: FW: Overburden Lift #KC-R7-090910-OB-4A Verification
Attachments: KC-R7-090910-OB-4A_1043.pdf

For your use in compiling the overburden pile data packages.

From: Fischer.Timothy@epamail.epa.gov [mailto:Fischer.Timothy@epamail.epa.gov]
Sent: Thursday, September 23, 2010 4:58 PM
To: Savage, Michael
Cc: glen.anderson@tronox.com
Subject: Fw: Overburden Lift #KC-R7-090910-OB-4A Verification

Mike,

Please find the verification information for OB lift #KC-R7-090910-OB-4A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 09/23/2010 04:57 PM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: TIMOTHY FISCHER/R5/USEPA/US@EPA
Cc: "Runyon, Tim" <Tim.Runyon@illinois.gov>
Date: 09/23/2010 01:45 PM
Subject: FW: Overburden Lift #KC-R7-090910-OB-4A Verification

From: Shafer, Steve
Sent: Thursday, September 16, 2010 7:42 AM
To: 'Fischer.Timothy@epamail.epa.gov'; Runyon, Tim
Subject: Overburden Lift #KC-R7-090910-OB-4A Verification

On 9/9/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-090910-OB-4A which was laid out in the East Overburden Lay-down area. Lift 4A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 9/09/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 Nal(TL) detector. The total lift area was approximately 50' wide by 200' long. 11 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 9/09/10 at 12:50 hrs under COC #1-1043. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-021. During the GPS gamma walkover survey REM, LLC identified no elevated areas of activity that was greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate

to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 3879 cpm
Gamma Count Rate Range : 2869 – 4944 cpm
Gamma Count Rate STD DEV : 326 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 9/7/10)

Sample concentration Average: 4.05 pCi/g
Sample concentration Range : 3.38 – 4.69 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Sample I.D.	Grid #	Sample Point	Result	Error	Ra-228	Ra-226	TOTAL										
104051	1-E	COMPOSITE	2.07	0.22	2.25	0.57	2.74	0.15	0.89	0.10	0.86	0.08	2.51	0.88	3.38		
104052	2-E	COMPOSITE	3.33	0.31	3.24	0.73	3.70	0.21	0.97	0.11	0.92	0.10	3.57	0.94	4.51		
104053	3-E	COMPOSITE	2.56	0.25	3.28	0.71	2.95	0.17	0.90	0.10	0.91	0.10	2.85	0.90	3.75		
104054	4-E	COMPOSITE	2.49	0.26	2.89	0.79	3.03	0.18	0.88	0.11	0.92	0.10	2.86	0.90	3.76		
104056	5-E	COMPOSITE	2.19	0.21	2.36	0.55	2.98	0.16	0.98	0.09	0.87	0.09	2.68	0.92	3.61		
104057	6-E	COMPOSITE	2.26	0.23	2.68	0.60	3.08	0.16	0.95	0.09	1.00	0.09	2.80	0.97	3.77		
104058	7-E	COMPOSITE	2.48	0.27	3.37	0.68	3.37	0.20	1.08	0.11	1.03	0.11	3.08	1.05	4.13		
104059	8-E	COMPOSITE	3.24	0.30	3.79	0.69	3.82	0.20	1.12	0.11	0.98	0.11	3.65	1.04	4.69		
104060	9-E	COMPOSITE	3.31	0.32	4.22	0.70	3.67	0.21	0.89	0.11	0.87	0.11	3.60	0.88	4.48		
104061	10-E	COMPOSITE	2.87	0.27	3.12	0.65	3.65	0.18	1.04	0.10	1.00	0.10	3.39	1.02	4.41		

**INFORMATION
ONLY**

Lift Average

4.05



COPY

Stephen Blodgett

OVERBURDEN PILE SAMPLING

Excavation Area: _____ Reach 7
 Date Sampled: _____ 9/9/2010
 PILE #: KC-R7-OB4 Est. Volume of Pile in Cubic Yards: _____ 242

Number of Samples Required Per SOP 214:
 5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB4-A	3.27				
KC-R7-OB4-B	4.00				
KC-R7-OB4-C	3.68				
KC-R7-OB4-D	3.82				
KC-R7-OB4-E	3.72				
KC-R7-OB4-F	4.71				
KC-R7-OB4-G (QC-E)	-----	4.00	0.38	0.21	0.29
Number of Samples (n)	6				
Average (Mean of the sample population) (X bar)	3.87				

$N = 6$

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_1)	0.44	"t" value	1.58
U_α (True Mean) = $(X \text{ bar}) + (t * (S_1 / \sqrt{n}))$	4.23	2.015	$QC < (Mean + 3S_{dup})?$ O.K.
Where " t " is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6			$QC > (Mean - 3S_{dup})?$ O.K.
Release Criteria	7.20		

$U_\alpha < Release\ Criteria?$

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
 LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
 AS ON SITE BACKFILL PER SOP-214

Donaldo G-12-10 / Michael F. Sandoval 09/15/10

Name/date
 John Pollio 9-15-10

REVIEWED: SESIARCADIS
 APPROVED: OFFSITES MANAGER:

Name/date

Kotwicki, Joseph

From: Savage, Michael
Sent: Friday, September 24, 2010 11:37 AM
To: Kotwicki, Joseph
Subject: FW: Overburden Lift #KC-R7-091010-OB-5A Verification
Attachments: KC-R7-091010-OB-5A_1044.pdf

For your use in compiling the overburden pile data packages.

From: Fischer.Timothy@epamail.epa.gov [mailto:Fischer.Timothy@epamail.epa.gov]
Sent: Thursday, September 23, 2010 4:58 PM
To: Savage, Michael
Cc: glen.anderson@tronox.com
Subject: Fw: Overburden Lift #KC-R7-091010-OB-5A Verification

Mike,

Please find the verification information for OB lift #KC-R7-091010-OB-5A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 09/23/2010 04:57 PM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: TIMOTHY FISCHER/R5/USEPA/US@EPA
Cc: "Runyon, Tim" <Tim.Runyon@illinois.gov>
Date: 09/23/2010 01:43 PM
Subject: FW: Overburden Lift #KC-R7-091010-OB-5A Verification

Tim, attached is the spreadsheet of this email that you have all ready received.

From: Shafer, Steve
Sent: Tuesday, September 21, 2010 6:52 PM
To: 'Fischer.Timothy@epamail.epa.gov'; Runyon, Tim
Subject: Overburden Lift #KC-R7-091010-OB-5A Verification

On 9/10/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-091010-OB-5A which was laid out in the West Overburden Lay-down area. Lift 5A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 9/10/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. Grid #10 was not part of this verification because TM contamination was found in the grid by SES HP Techs and this materials was removed prior to this verification being turned over to IEMA/DNS. SES elected to go forward with this verification with out replacing this material. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 Nal(TL) detector. The total lift area was approximately 50' wide by 200' long. 10 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 9/10/10 at 15:30 hrs under COC #1-1044. All supporting documentation for this survey

can be found in IEMA/DNS Surveillance #10-021. During the GPS gamma walkover survey REM, LLC personnel identified elevated areas of activity greater than the 8,000 cpm action level in Grid 10-W. These elevated areas appeared to be residuals left in place during the cleanup of the original elevated areas that were identified by the HP Techs. After the residuals (about 1 yard) were cleaned up REM, LLC personnel reverified this area and found it to meet the site cleanup criteria. One soil sample result from Grid @ 2W was found to be 9.21 pCi/g however the average was below 7.2 pCi/g. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 4606 cpm
Gamma Count Rate Range : 3186 – 9367 cpm
Gamma Count Rate STD DEV : 1006 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 9/21/10)

Sample concentration Average: 5.83 pCi/g
Sample concentration Range : 4.64 – 9.21 pCi/g

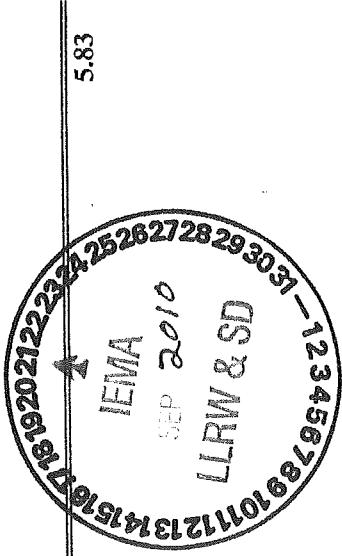
Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

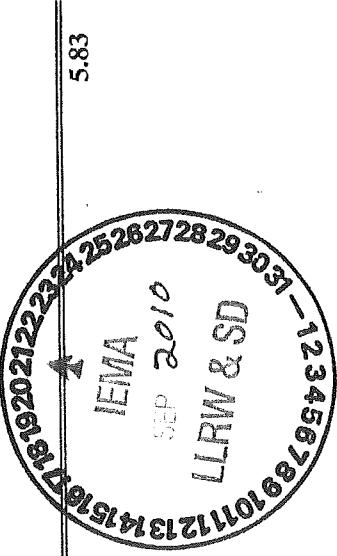
Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

Parcel Number:	11044	Kress Creek Reach 7 Overburden Lift #KC-R7-091010-OB-5A (West Area): COC# 1-1044, September 10, 2010	Tl-208	Bi-212	Ac-228	Bi-214	Pb-214		Ra-228	Ra-226	TOTAL
Sample I.D.	Grid #	Sample Point	Result	Error	Result	Error	Result	Error	Result	Error	
104062	1-W	COMPOSITE	3.75	0.33	4.36	0.78	4.88	0.21	0.93	0.09	0.98
104063	2-W	COMPOSITE	6.79	0.51	6.75	0.87	9.14	0.32	0.97	0.11	0.82
104064	3-W	COMPOSITE	3.97	0.34	4.52	0.68	5.48	0.23	0.88	0.10	0.97
104066	4-W	COMPOSITE	3.12	0.29	2.96	0.53	3.99	0.19	1.00	0.10	0.97
104067	5-W	COMPOSITE	3.17	0.29	3.11	0.68	4.26	0.20	1.07	0.11	1.06
104068	6-W	COMPOSITE	3.46	0.31	3.96	0.64	4.72	0.21	1.18	0.12	1.05
104069	7-W	COMPOSITE	3.38	0.31	3.40	0.69	4.86	0.22	1.03	0.10	0.97
104070	8-W	COMPOSITE	3.70	0.32	3.41	0.73	4.73	0.21	0.96	0.11	0.98
104071	9-W	COMPOSITE	4.14	0.36	4.51	0.75	6.06	0.25	0.89	0.11	0.94



Lift Average



5.83

COPY

Stephen Belcher

OVERBURDEN PILE SAMPLING

Excavation Area: _____ Reach 7
 Date Sampled: _____ 9/10/2010

PILE # : KC-R7-OB5 Est. Volume of Pile in Cubic Yards: _____ 171

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB5-A	5.16					
KC-R7-OB5-B	5.32					
KC-R7-OB5-C	3.79					
KC-R7-OB5-D	4.52					
KC-R7-OB5-E	4.42					
KC-R7-OB5-F (QC-D)			4.80	0.40	0.22	0.31
Number of Samples (n)	5					
Average (Mean of the sample population) (\bar{X} bar)	4.64					

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_1) 0.55 t'' value 2.132

U_α (True Mean) = $(\bar{X} \text{ bar}) + (t * (S_1 / \sqrt{n}))$
 Where t'' is a statistic used for small sample tests
 or hypotheses the Student Distribution), from
 SOP No. KMS-102, Attachment 10.6

Release Criteria 7.20

$U_\alpha < \text{Release Criteria}$

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214		
REVIEWED: SES/ARCADIS	$3 \times S_{dup} =$ Mean + $3 S_{dup} =$ Mean - $3 S_{dup} =$	1.90 6.54 2.74
APPROVED: OFFSITES MANAGER:	$QC < (\text{Mean} + 3S_{dup})?$ $QC > (\text{Mean} - 3S_{dup})?$	O.K. O.K.

Daleh 9-12-10 / Michael F. Savage 09/15/10

Name/date
 Daleh 9-12-10
 Michael F. Savage 09/15/10

Name/date

Number of Samples
Required Per SOP 214:
5

Check if QC Sample Dup. is within 3 Standard Deviations (3 S_{dup}) of the mean of the sample population, per SOP 214, Paragraph 11.1	
$3 \times S_{dup} =$ Mean + $3 S_{dup} =$ Mean - $3 S_{dup} =$	1.90 6.54 2.74



Infrastructure, environment, buildings

Transmittal Letter

To:
 Glen Anderson, Construction Manager
 Tronox
 800 Weyrauch Street
 West Chicago, IL 60185

Copies:
 Heather VanDewalker, ARCADIS
 Marty Folan, Sevenson

ARCADIS
 800 Weyrauch Street
 West Chicago
 Illinois 60185
 Tel 630.293.7695, Ext. 11
 Fax 630.293.7719
KC 183

From:
 Michael Savage

Date:
 September 21, 2010

Subject:
 Kress Creek/West Branch Remedial Action
 Project – Reach 7

ARCADIS Project No.:
 B0071034.0000

We are sending you:

Attached Under Separate Cover Via _____ the Following Items:

- | | | | |
|--|----------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Shop Drawings | <input type="checkbox"/> Plans | <input type="checkbox"/> Specifications | <input type="checkbox"/> Change Order |
| <input type="checkbox"/> Prints | <input type="checkbox"/> Samples | <input type="checkbox"/> Copy of Letter | <input type="checkbox"/> Reports |
| <input checked="" type="checkbox"/> Other: Reach 7 Overburden Lift Radiological Sample Results | | | |

Copies	Date	Drawing No.	Rev.	Description	Action*
Reach 7 – Overburden Lift Sample Results					
1	09/21/2010	Pile # KC-R7-OB6		KC-R7-OB6-A through KC-R7-OB6-E (and one QC-C sample)	F
1	09/21/2010	Pile # KC-R7-OB7		KC-R7-OB7-A through KC-R7-OB7-E (and one QC-C sample)	F
1	09/21/2010	Pile # KC-R7-OB8		KC-R7-OB8-A through KC-R7-OB8-E (and one QC-C sample)	F
1	09/21/2010	N/A		Reach 7 Overburden Piles Tracking Spreadsheet for 2010	F

Action*

- | | | |
|---|--|--|
| <input type="checkbox"/> A Approved | <input type="checkbox"/> CR Correct and Resubmit | <input type="checkbox"/> Resubmit _____ Copies |
| <input type="checkbox"/> AN Approved As Noted | <input checked="" type="checkbox"/> F File | <input type="checkbox"/> Return _____ Copies |
| <input type="checkbox"/> AS As Requested | <input type="checkbox"/> FA For Approval | <input type="checkbox"/> Review and Comment |
| <input type="checkbox"/> Other: _____ | | |

Mailing Method

- | | | | |
|--|---|---|---|
| <input type="checkbox"/> U.S. Postal Service 1 st Class | <input checked="" type="checkbox"/> Courier/Hand Delivery | <input type="checkbox"/> FedEx Priority Overnight | <input type="checkbox"/> FedEx 2-Day Delivery |
| <input type="checkbox"/> Certified/Registered Mail | <input type="checkbox"/> United Parcel Service (UPS) | <input type="checkbox"/> FedEx Standard Overnight | <input type="checkbox"/> FedEx Economy |
| <input type="checkbox"/> Other: _____ | | | |

Comments: _____

Kotwicki, Joseph

From: Savage, Michael
Sent: Friday, September 24, 2010 11:37 AM
To: Kotwicki, Joseph
Subject: FW: Overburden Lift #KC-R7-091410-OB-6A Verification
Attachments: KC-R7-091410-OB-6A_1045.pdf

For your use in compiling the overburden pile data packages.

From: Fischer.Timothy@epamail.epa.gov [mailto:Fischer.Timothy@epamail.epa.gov]
Sent: Thursday, September 23, 2010 5:00 PM
To: Savage, Michael
Cc: glen.anderson@tronox.com
Subject: Fw: Overburden Lift #KC-R7-091410-OB-6A Verification

Mike,

Please find the verification information for OB lift #KC-R7-091410-OB-6A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 09/23/2010 04:59 PM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 09/23/2010 01:17 PM
Subject: Overburden Lift #KC-R7-091410-OB-6A Verification

On 9/14/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-091410-OB-6A which was laid out in the East Overburden Lay-down area. Lift 6A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 9/14/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(Tl) detector. The total lift area was approximately 80' wide by 200' long. 10 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 9/15/10 at 09:40 hrs under COC #1-1045. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-024. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 3281 cpm
Gamma Count Rate Range : 2637 – 4116 cpm
Gamma Count Rate STD DEV : 288 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 9/23/10)

Sample concentration Average: 2.51 pCi/g
Sample concentration Range : 1.55 – 3.43 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Parcel Number:	11045	Kress Creek Reach 7 Overburden Lift #KC-R7-091410-OB-6A (West Area): COC# 1-1045	September 14, 2010									
			Tl-208	Bi-212	Ac-228	Bi-214	Pb-214	Ra-228	Error	Ra-228	Error	Ra-226
Sample I.D.	Grid #	Sample Point	Result	Error	Result	Error	Result	Error	Result	Error	Result	
104072	1-E	COMPOSITE	1.12	0.13	1.23	0.37	1.23	0.09	0.32	0.05	0.40	0.06
104073	2-E	COMPOSITE	2.34	0.23	2.58	0.54	2.65	0.15	0.56	0.09	0.56	0.07
104074	3-E	COMPOSITE	1.45	0.16	1.19	0.43	1.60	0.11	0.48	0.06	0.44	0.06
104076	4-E	COMPOSITE	2.07	0.20	2.48	0.51	2.40	0.13	0.52	0.07	0.47	0.06
104077	5-E	COMPOSITE	1.51	0.17	1.66	0.45	1.74	0.13	0.49	0.07	0.44	0.06
104078	6-E	COMPOSITE	2.21	0.22	2.29	0.51	2.41	0.14	0.43	0.07	0.50	0.07
104079	7-E	COMPOSITE	1.64	0.18	1.99	0.49	1.82	0.12	0.50	0.07	0.52	0.07
104080	8-E	COMPOSITE	2.00	0.20	2.27	0.57	2.41	0.14	0.43	0.07	0.46	0.07
104081	9-E	COMPOSITE	1.62	0.17	2.28	0.43	1.69	0.12	0.52	0.07	0.52	0.07
104082	10-E	COMPOSITE	2.64	0.25	2.49	0.56	2.97	0.16	0.58	0.07	0.59	0.08

**INFORMATION
ONLY**

COPY

Lift Average

2.51



Stephen B. Blahey

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7

Date Sampled: 9/14/2010

PILE #: KC-R7-OB6

Est. Volume of Pile in Cubic Yards: 170

Number of Samples
Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB6-A	2.08					
KC-R7-OB6-B	2.72					
KC-R7-OB6-C	2.33					
KC-R7-OB6-D	2.35					
KC-R7-OB6-E	3.11					
KC-R7-OB6-F (QC-C)			2.51	0.23	0.12	0.18
Number of Samples (n)	<u>5</u>					
Average (Mean of the sample population) (X bar)	<u>2.52</u>					

Average of samples is <7.2 pCi/g, Proceed with Confidence Level Check described in
SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_i)

$$U_\alpha (\text{True Mean}) = (X \text{ bar}) + (t * (S_i / \sqrt{n}))$$

Where "t" is a statistic used for small sample tests
of hypotheses (the Student Distribution), from
SOP No. KMS-102, Attachment 10.6

Release Criteria

7.20

$U_\alpha < \text{Release Criteria?}$

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
AS ON SITE BACKFILL PER SOP-214

REVIEWED: SESIARCAIS
John P. Sandoval

APPROVED: OFFSITES MANAGER:
Michael F. Sandoval

Name/date
John P. Sandoval 9-21-10

Name/date

Check if QC Sample Dup. is within 3 Standard Deviations ($3 S_{dup}$) of the mean of the sample population, per SOP 214, paragraph 11.1
$3 \times S_{dup} = 1.20$ $\text{Mean} + 3 S_{dup} = 3.72$ $\text{Mean} - 3 S_{dup} = 1.32$ $QC < (\text{Mean} + 3 S_{dup})?$ O.K. $QC > (\text{Mean} - 3 S_{dup})?$ O.K.

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, October 12, 2010 10:31 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-091410-OB-7A Verification
Attachments: KC-R7-091410-OB-7A_1046.pdf

Mike,

Please find the verification information for OB lift #KC-R7-091410-OB-7A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/12/2010 10:29 AM

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Jim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 09/24/2010 05:11 PM
Subject: Overburden Lift #KC-R7-091410-OB-7A Verification

On 9/14/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-091410-OB-7A which was laid out in the West Overburden Lay-down area. Lift 7A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 9/14/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 60' wide by 120' long. 7 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 9/15/10 at 09:40 hrs under COC #1-1046. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-024. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 3527 cpm
Gamma Count Rate Range : 2406 - 4922 cpm
Gamma Count Rate STD DEV : 421 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 9/24/10)

Sample concentration Average: 3.77 pCi/g

Sample concentration Range : 2.79 - 4.79 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM, LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell
(See attached file: KC-R7-091410-OB-7A_1046.pdf)

Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

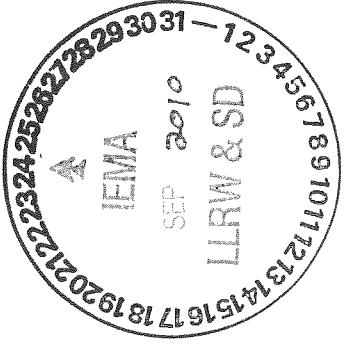
Parcel Number: 11046 Kress Creek Reach 7 Overburden Lift #KC-R7-091410-OB-7A (West Area): COC# 1-1046, September 14, 2010

Sample I.D.	Grid #	Sample Point	Result	Error	TOTAL												
104083	1-W	COMPOSITE	1.97	0.21	2.49	0.55	2.48	0.14	0.43	0.07	0.51	0.08	2.32	0.47	2.79		
104084	2-W	COMPOSITE	2.48	0.24	2.97	0.58	3.18	0.18	0.55	0.08	0.60	0.08	2.93	0.57	3.51		
104085	2-W	COMPOSITE	2.89	0.27	2.76	0.60	3.11	0.17	0.71	0.09	0.73	0.08	3.03	0.72	3.75		
104086	3-W	COMPOSITE	3.27	0.30	3.66	0.77	3.69	0.19	0.70	0.09	0.67	0.10	3.57	0.69	4.26		
104087	4-W	COMPOSITE	3.56	0.33	3.98	0.71	4.19	0.20	0.75	0.09	0.79	0.09	4.01	0.77	4.79		
104088	5-W	COMPOSITE	1.93	0.20	1.92	0.54	2.33	0.15	0.83	0.09	0.85	0.09	2.17	0.84	3.01		
104089	6-W	COMPOSITE	3.03	0.28	2.60	0.62	3.27	0.19	0.57	0.09	0.58	0.09	3.16	0.57	3.74		
104090	7-W	COMPOSITE	3.21	0.29	3.33	0.69	3.89	0.19	0.60	0.08	0.65	0.08	3.67	0.62	4.29		

**INFORMATION
ONLY**

Lift Average

3.77



John B. Strober

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 9/14/2010

PILE # : KC-R7-OB7 Est. Volume of Pile in Cubic Yards: 188

Number of Samples
Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	S_2	S_{dup}
KC-R7-OB7-A	3.73					
KC-R7-OB7-B	3.45					
KC-R7-OB7-C	3.29					
KC-R7-OB7-D	3.52					
KC-R7-OB7-E	3.08					
KC-R7-OB7-F (QC-C)	-----	2.90	0.29	0.14	0.22	
Number of Samples (n)	<u>5</u>					
Average (Mean of the sample population) (\bar{X} bar)	<u>3.41</u>					

Average of samples is <7.2 pCi/g, Proceed with Confidence Level Check described in
SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_1)	0.22	t^* value 2.132	U_a (True Mean) = $(\bar{X} \text{ bar}) + (t^* (S_1 / \sqrt{n}))$ Where " t^* " is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	0.92	SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214
Release Criteria	7.20				

$U_a < \text{Release Criteria?}$

$U_a < \text{Release Criteria?}$
Where U_a = $(\bar{X} \text{ bar}) + (t^* (S_1 / \sqrt{n}))$

Mikhail Sotiroff 09/20/10

Tom Parker 9-21-10

Name/date

REVIEWED: SESI/ARCADIS

APPROVED: OFFSITES MANAGER:

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, October 12, 2010 10:32 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-091410-OB-8A Verification
Attachments: KC-R7-091410-OB-8A_1047.pdf

Mike,

Please find the verification information for OB lift #KC-R7-091410-OB-8A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/12/2010 10:31 AM

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 09/28/2010 04:17 PM
Subject: Overburden Lift #KC-R7-091410-OB-8A Verification

On 9/14/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-091410-OB-8A which was laid out in the North Overburden Lay-down area. Lift 8A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 9/14/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 40' wide by 200' long. 7 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 9/15/10 at 09:40 hrs under COC #1-1047. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-024. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 4074 cpm
Gamma Count Rate Range : 3025 - 5711 cpm
Gamma Count Rate STD DEV : 406 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 9/24/10)

Sample concentration Average: 4.90 pCi/g

Sample concentration Range : 4.11 - 5.55 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell
(See attached file: KC-R7-091410-OB-8A_1047.pdf)

Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

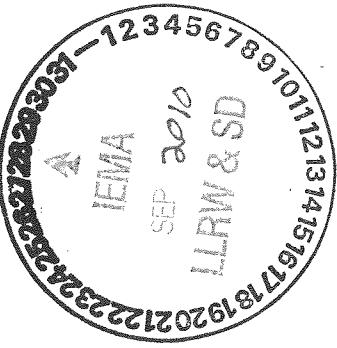
Parcel Number: 1104-7 Kress Creek Reach 7 Overburden Lift #KC-R7-091410-OB-8A (North Area): COC# 1-1047, September 14, 2010

Sample I.D.	Grid #	Sample Point	Result	Error	Pb-214	Bi-214	Bi-214	TOTAL												
104091	1-N	COMPOSITE	2.97	0.28	3.74	0.75	4.08	0.20	0.80	0.10	0.82	0.10	3.72	0.81	4.53					
104092	2-N	COMPOSITE	2.75	0.26	2.25	0.63	3.74	0.19	0.79	0.09	0.78	0.08	3.33	0.78	4.11					
104093	3-N	COMPOSITE	3.25	0.29	3.31	0.63	4.21	0.20	1.37	0.12	1.17	0.11	3.86	1.26	5.12					
104094	4-N	COMPOSITE	3.12	0.29	3.62	0.63	4.36	0.20	1.12	0.11	1.16	0.11	3.94	1.14	5.08					
104096	4-N	COMPOSITE	3.01	0.27	2.98	0.67	3.96	0.19	1.11	0.11	1.16	0.11	3.60	1.13	4.73					
104097	5-N	COMPOSITE	3.56	0.32	3.34	0.71	4.20	0.20	1.16	0.12	1.24	0.11	3.97	1.20	5.17					
104098	6-N	COMPOSITE	3.61	0.32	4.26	0.72	4.61	0.22	1.28	0.12	1.24	0.11	4.29	1.26	5.55					

**INFORMATION
ONLY**

Lift Average

4.90



OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 9/15/2010

PILE #: KC-R7-OB8
 Est. Volume of Pile in Cubic Yards: 130

Number of Samples
 Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB8-A	4.83					
KC-R7-OB8-B	4.96					
KC-R7-OB8-C	4.25					
KC-R7-OB8-D	5.26					
KC-R7-OB8-E	4.05					
KC-R7-OB8-F (QC-C)			4.52	0.37	0.22	0.29
Number of Samples (n)	<u>5</u>					
Average (Mean of the sample population) (\bar{X} bar)	<u>4.67</u>					

Average of samples is <7.2 pCi/g, Proceed with Confidence Level Check described in
 SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_1)	0.45	"t" value 2.132	$3 \times S_{dup} =$ Mean + 3 S_{dup} = Mean - 3 S_{dup} =	1.62
U_a (True Mean) = (X bar) + (t * (S_1 / \sqrt{n})) Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	5.10		QC < (Mean + 3 S_{dup})? QC > (Mean - 3 S_{dup})?	O.K. O.K.
Release Criteria	7.20			

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
 LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
 AS ON SITE BACKFILL PER SOP-214

Mark F. Snarey 09/20/2010

Mark F. Snarey 09/20/2010

Name/date

REVIEWED: SESIARCAIS

APPROVED: OFFSITES MANAGER:

Name/date



Infrastructure, environment, buildings

Transmittal Letter

To:
Glen Anderson, Construction Manager
Tronox
800 Weyrauch Street
West Chicago, IL 60185

Copies:
Heather VanDewalker, ARCADIS
Marty Folan, Sevenson

ARCADIS
800 Weyrauch Street
West Chicago
Illinois 60185
Tel 630.293.7695, Ext. 11
Fax 630.293.7719

KC 185

From:
Michael Savage

Date:
September 22, 2010

Subject:
Kress Creek/West Branch Remedial Action
Project – Reach 7

ARCADIS Project No.:
B0071034.0000

We are sending you:
 Attached

Under Separate Cover Via _____ the Following Items:

- | | | | |
|--|----------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Shop Drawings | <input type="checkbox"/> Plans | <input type="checkbox"/> Specifications | <input type="checkbox"/> Change Order |
| <input type="checkbox"/> Prints | <input type="checkbox"/> Samples | <input type="checkbox"/> Copy of Letter | <input type="checkbox"/> Reports |
| <input checked="" type="checkbox"/> Other: Reach 7 Overburden Lift Radiological Sample Results | | | |

Copies	Date	Drawing No.	Rev.	Description	Action*
		Reach 7		Reach 7 – Overburden Lift Sample Results	
1	09/22/2010	Pile # KC-R7-OB9		KC-R7-OB9-A through KC-R7-OB9-E (and one QC-A sample)	F
1	09/22/2010	Pile # KC-R7-OB10		KC-R7-OB10-A through KC-R7-OB10-E (and one QC-C sample)	F
1	09/22/2010	Pile # KC-R7-OB11		KC-R7-OB11-A through KC-R7-OB11-E (and one QC-B sample)	F
1	09/22/2010	N/A		Reach 7 Overburden Piles Tracking Spreadsheet for 2010	F

Action*

- A Approved
 AN Approved As Noted
 AS As Requested
 Other: _____

- CR Correct and Resubmit
 F File
 FA For Approval

- Resubmit _____ Copies
 Return _____ Copies
 Review and Comment

Mailing Method

- U.S. Postal Service 1st Class
 Certified/Registered Mail
 Other: _____
- Courier/Hand Delivery
 United Parcel Service (UPS)
- FedEx Priority Overnight
 FedEx Standard Overnight
- FedEx 2-Day Delivery
 FedEx Economy

Comments: Samples taken from pile # KC-R7-OB10 did not meet release criteria. As such, this pile was treated as targeted material.

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, October 12, 2010 10:33 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-091510-OB-9A Verification
Attachments: KC-R7-091510-OB-9A_1048.pdf

Mike,

Please find the verification information for OB lift #KC-R7-091510-OB-9A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/12/2010 10:32 AM

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/01/2010 04:48 PM
Subject: Overburden Lift #KC-R7-091510-OB-9A Verification

On 9/15/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-091510-OB-9A which was laid out in the East Overburden Lay-down area. Lift 9A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 9/15/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 80' wide by 150' long. 10 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 9/16/10 at 09:00 hrs under COC #1-1048. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-025. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 3619 cpm
Gamma Count Rate Range : 2780 - 4554 cpm
Gamma Count Rate STD DEV : 332 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 9/24/10)

Sample concentration Average: 4.08 pCi/g

Sample concentration Range : 3.76 - 4.39 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
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(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell
(See attached file: KC-R7-091510-0B-9A_1048.pdf)

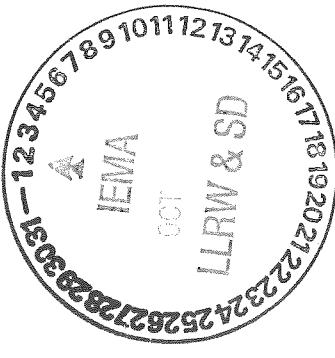
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Sample I.D.	Grid #	Sample Point	Result	Error	Result	Error	Result	Error	Result	Error	Ra-228	Ra-226	TOTAL	
104099	1-E	COMPOSITE	2.61	0.26	3.00	0.60	3.86	0.20	0.71	0.10	0.68	0.09	3.38	0.69
104100	2-E	COMPOSITE	2.54	0.26	2.66	0.70	3.86	0.19	0.70	0.09	0.67	0.08	3.35	0.69
104101	3-E	COMPOSITE	2.65	0.25	3.15	0.61	3.70	0.19	0.66	0.08	0.64	0.09	3.32	0.65
104102	4-E	COMPOSITE	3.22	0.30	3.31	0.71	3.72	0.20	0.65	0.09	0.75	0.09	3.56	0.70
104103	5-E	COMPOSITE	2.52	0.24	2.51	0.51	3.57	0.18	0.67	0.09	0.61	0.07	3.14	0.64
104104	6-E	COMPOSITE	2.56	0.25	2.59	0.55	3.49	0.18	0.65	0.09	0.57	0.08	3.15	0.61
104106	7-E	COMPOSITE	3.16	0.28	4.22	0.68	3.66	0.19	0.86	0.10	0.85	0.10	3.54	0.85
104107	8-E	COMPOSITE	2.93	0.28	3.10	0.64	3.21	0.19	0.88	0.10	0.79	0.10	3.12	0.83
104108	9-E	COMPOSITE	3.07	0.29	3.61	0.67	3.43	0.19	1.01	0.10	0.89	0.10	3.33	0.95
104109	10-E	COMPOSITE	3.01	0.30	4.18	0.72	3.41	0.20	0.97	0.10	0.89	0.10	3.33	0.93
													4.26	

**INFORMATION
ONLY**

Lift Average

4.08



Stephen B. Schaffer

OVERBURDEN PILE SAMPLING

Excavation Area:	Reach 7																																																	
Date Sampled:	9/15/2010																																																	
PILE # : KC-R7-OB9		Est. Volume of Pile in Cubic Yards: 170																																																
Number of Samples Required Per SOP 214: 5																																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Sample #</th> <th style="width: 40%;">Total Radium in pCi/g (Th 232 + Ra 226)</th> <th style="width: 20%;">QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)</th> <th style="width: 20%;">2 sigma uncertainty (Ra 226)</th> </tr> </thead> <tbody> <tr><td>KC-R7-OB9-A</td><td>4.30</td><td></td><td></td></tr> <tr><td>KC-R7-OB9-B</td><td>3.66</td><td></td><td></td></tr> <tr><td>KC-R7-OB9-C</td><td>4.22</td><td></td><td></td></tr> <tr><td>KC-R7-OB9-D</td><td>3.50</td><td></td><td></td></tr> <tr><td>KC-R7-OB9-E</td><td>4.52</td><td></td><td></td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td>KC-R7-OB9-F (QC-A)</td><td> </td><td>4.36</td><td>0.41</td></tr> <tr><td> </td><td> </td><td> </td><td>0.17</td></tr> <tr><td> </td><td> </td><td> </td><td>0.29</td></tr> </tbody> </table>			Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	KC-R7-OB9-A	4.30			KC-R7-OB9-B	3.66			KC-R7-OB9-C	4.22			KC-R7-OB9-D	3.50			KC-R7-OB9-E	4.52															KC-R7-OB9-F (QC-A)		4.36	0.41				0.17				0.29
Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)																																															
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KC-R7-OB9-F (QC-A)		4.36	0.41																																															
			0.17																																															
			0.29																																															
Number of Samples (n)	5	$S_{dup} = \sqrt{(S_1^2 + S_2^2)} = 0.49$																																																
Average (Mean of the sample population) (\bar{X} bar)	4.04																																																	
<small>Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12</small>																																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Standard Deviation of sample population (S_1)</th> <th style="width: 30%;">0.39</th> <th style="width: 40%;">"t" value 2.132</th> </tr> </thead> <tbody> <tr> <td>U_α (True Mean) = $(\bar{X}$ bar) + $(t * (S_1 / \sqrt{n}))$</td> <td>4.41</td> <td>$QC < (\text{Mean} + 3S_{dup})?$ 5.50</td> </tr> <tr> <td>Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6</td> <td></td> <td>$QC > (\text{Mean} - 3S_{dup})?$ 2.58</td> </tr> <tr> <td>Release Criteria</td> <td>7.20</td> <td>O.K. O.K.</td> </tr> </tbody> </table>			Standard Deviation of sample population (S_1)	0.39	"t" value 2.132	U_α (True Mean) = $(\bar{X}$ bar) + $(t * (S_1 / \sqrt{n}))$	4.41	$QC < (\text{Mean} + 3S_{dup})?$ 5.50	Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6		$QC > (\text{Mean} - 3S_{dup})?$ 2.58	Release Criteria	7.20	O.K. O.K.																																				
Standard Deviation of sample population (S_1)	0.39	"t" value 2.132																																																
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Release Criteria	7.20	O.K. O.K.																																																
<small>SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214</small>																																																		
REVIEWED: SESARADIS	<i>John Michael F. Savage</i> 09/12/10																																																	
APPROVED: OFFSITES MANAGER:	<i>John Michael F. Savage</i> 09/12/10																																																	

Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, October 12, 2010 10:34 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-091610-OB-10A Verification
Attachments: KC-R7-091610-OB-10A_1049.pdf; SES OB 10 Sample Results.pdf

Mike,

Please find the verification information for OB lift #KC-R7-091610-OB-10A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/12/2010 10:33 AM

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/09/2010 01:11 PM
Subject: Overburden Lift #KC-R7-091610-OB-10A Verification

On 9/16/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-091610-OB-10A which was laid out in the West Overburden Lay-down area. Lift 10A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 9/16/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 60' wide by 120' long. 8 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 9/17/10 at 10:10 hrs under COC #1-1049. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-026. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level however there were large areas in this lift that were found to have spotty readings in the 7000 to 7500 cpm range. In addition to attaching the IEMA/DNS summary analysis results I have attached the Tronox Laboratory summary results. Since the Tronox results failed to meet the cleanup objective of 7.2 pCi/g Total Radium at a 95% confidence level, SES decided to push the material up and dispose of it as Targeted Material instead of collecting more samples. This decision was made without discussing these options with project oversight or USEPA. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 4794 cpm
Gamma Count Rate Range : 2976 - 7564 cpm
Gamma Count Rate STD DEV : 979 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 9/24/10)

Sample concentration Average: 5.63 pCi/g
Sample concentration Range : 6.66 - 4.67 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM, LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell
(See attached file: KC-R7-091610-OB-10A_1049.pdf)(See attached file:
SES OB 10 Sample Results.pdf)

Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Parcel Number:	Grid #	Sample Point	Result	Error	Bi-212	Ac-228	Bi-214	Pb-214	September 16, 2010			
									Result	Error	Result	Error
104110	1-W	COMPOSITE	4.58	0.39	4.96	0.96	6.31	0.26	0.91	0.10	0.95	0.10
104111	2-W	COMPOSITE	4.16	0.37	5.17	0.89	6.08	0.25	0.96	0.11	0.94	0.11
104112	3-W	COMPOSITE	4.48	0.37	4.33	0.76	5.70	0.25	1.33	0.12	1.25	0.11
104113	4-W	COMPOSITE	3.23	0.31	3.04	0.69	4.68	0.22	1.18	0.11	1.11	0.12
104114	5-W	COMPOSITE	3.01	0.28	3.59	0.64	4.11	0.19	1.07	0.11	1.03	0.10
104116	6-W	COMPOSITE	3.32	0.30	3.32	0.72	4.29	0.20	1.22	0.11	1.07	0.10
104117	7-W	COMPOSITE	3.11	0.28	2.99	0.59	4.21	0.20	0.89	0.10	0.86	0.10

Lift Average

5.63

OVERBURDEN PILE SAMPLING

Excavation Area: _____ Reach 7
 Date Sampled: 9/16/2010
 FILE #: KC-R7-OB10 Est. Volume of Pile in Cubic Yards: 188

Number of Samples Required Per SOP 214:
 5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	S_2	S_dup
KC-R7-OB10-A	7.09		2 sigma uncertainty (Th 232)	Std. Dev. for the analyses of the duplicate sample
KC-R7-OB10-B	7.98			Std. Dev. of the duplicate sampling & measurement
KC-R7-OB10-C	7.92			
KC-R7-OB10-D	6.29			
KC-R7-OB10-E	5.36			
KC-R7-OB10-F (OC-C)	-----	6.48	0.56	0.42
Number of Samples (n)	5			
Average Mean of the sample population) (\bar{X} bar)	6.93			

Average of samples is < 7.2 pCi/g Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_2)	1.00	t'' value	3.25
$U_{\alpha} (\text{True Mean}) = (\bar{X} \text{ bar}) + (t * (S_2 / \sqrt{n}))$ Where "t" is a statistic used for small sample tests or hypotheses (the Student Distribution), from SOP NO. KWS-102, Attachment 10-6	7.88	2.132	QC < (Mean + 3S _{dup}) ? O.K. QC > (Mean - 3S _{dup}) ? O.K.
Release Criteria	7.20		

SAMPLES DO NOT MEET 95% CONFIDENCE LEVEL -
NEED TO COLLECT MORE SAMPLES

$U_{\alpha} <$ Release Criteria?

REVIEWED: SES/ARCADIS

APPROVED: OFFSITES MANAGER:

Name/date

Name/date

Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Monday, October 25, 2010 9:16 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-091710-OB-11A Verification
Attachments: KC-R7-091710-OB-11A_1050.pdf

Mike,

Please find the verification information for OB lift #KC-R7-091710-OB-11A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/25/2010 09:15 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/13/2010 04:11 PM
Subject: Overburden Lift #KC-R7-091710-OB-11A Verification

On 9/17/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-091710-OB-11A which was laid out in the East Overburden Lay-down area. Lift 11A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 9/17/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 80' wide by 120' long. 11 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 9/20/10 at 09:45 hrs under COC #1-1050. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-027. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 3937 cpm
Gamma Count Rate Range : 2140 - 5782 cpm
Gamma Count Rate STD DEV : 838 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 10/13/10)

Sample concentration Average: 3.17 pCi/g
Sample concentration Range : 1.06 – 5.73 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

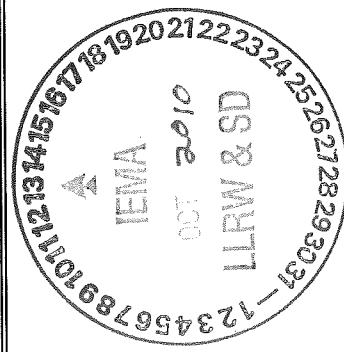
Parcel Number: 11050 Kress Creek Reach 7 Overburden Lift #KC-R7-091710-OB-11A (East Area); COC# 1-1050, September 17, 2010

Sample I.D.	Grid #	Sample Point	Result	Error	TOTAL										
104118	1-E	COMPOSITE	4.40	0.37	4.50	0.75	4.93	0.22	0.96	0.10	0.96	0.10	4.77	0.96	5.73
104119	2-E	COMPOSITE	0.59	0.09	0.94	0.26	0.69	0.07	0.43	0.05	0.35	0.04	0.67	0.39	1.06
104120	3-E	COMPOSITE	3.09	0.27	2.88	0.57	4.24	0.19	0.85	0.09	0.82	0.09	3.80	0.84	4.64
104121	4-E	COMPOSITE	1.56	0.17	1.62	0.42	1.88	0.12	0.65	0.07	0.52	0.06	1.76	0.58	2.34
104122	5-E	COMPOSITE	0.81	0.10	0.93	0.32	0.89	0.07	0.38	0.05	0.36	0.05	0.86	0.37	1.24
104123	6-E	COMPOSITE	2.20	0.22	2.53	0.54	2.99	0.16	1.09	0.10	0.99	0.10	2.71	1.04	3.75
104124	7-E	COMPOSITE	1.26	0.16	1.48	0.36	1.55	0.11	0.54	0.07	0.53	0.06	1.46	0.53	1.99
104126	8-E	COMPOSITE	2.56	0.24	2.74	0.50	3.36	0.17	0.93	0.10	0.90	0.10	3.07	0.91	3.99
104127	9-E	COMPOSITE	1.67	0.18	1.71	0.54	2.21	0.13	0.96	0.09	0.78	0.08	2.02	0.86	2.87
104128	10-E	COMPOSITE	2.66	0.26	2.73	0.66	3.56	0.18	0.90	0.10	0.90	0.09	3.24	0.90	4.14

**INFORMATION
ONLY**

Lift Average

3.17



Stephen B. Stenger

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 9/17/2010

PILE # : KC-R7-OB11 Est. Volume of Pile in Cubic Yards: 170

Number of Samples
Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	Std. Dev. for the analyses of the duplicate sample	S_{dup}
KC-R7-OB11-A	5.05					
KC-R7-OB11-B	4.44					
KC-R7-OB11-C	4.39					
KC-R7-OB11-D	4.22					
KC-R7-OB11-E	2.54					
KC-R7-OB11-F (QC-B)	-----	3.09	0.38	0.50	0.44	
Number of Samples (n)	<u>5</u>					
Average (Mean of the sample population) (\bar{X} bar)	<u>4.13</u>					

Average of samples is <7.2 pCi/g, Proceed with Confidence Level Check described in
SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_i)	0.84	"t" value 2.132	$3 \times S_{dup} =$ 2.85
U_α (True Mean) = $(\bar{X}$ bar) + $(t * (S_i/\sqrt{n}))$	4.93	$QC < (\text{Mean} + 3S_{dup})?$ 6.97	O.K.
Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6		$QC > (\text{Mean} - 3S_{dup})?$ 1.28	O.K.
Release Criteria	7.20		

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
AS ON SITE BACKFILL PER SOP-214

$U_\alpha <$ Release Criteria?

$3 \times S_{dup} =$ Mean + 3 $S_{dup} =$ Mean - 3 $S_{dup} =$	$3 \times S_{dup} =$ Mean + 3 $S_{dup} =$ Mean - 3 $S_{dup} =$
--	--

Michael F. Savage 09/22/10

REVIEWED: SES/ARCADIS

APPROVED: OFFSITES MANAGER:

John Aar 9-22-10

Name/date

Transmittal Letter

To:
 Glen Anderson, Construction Manager
 Tronox
 800 Weyrauch Street
 West Chicago, IL 60185

Copies:
 Heather VanDewalker, ARCADIS
 Marty Folan, Sevenson

KC 188 B

From:
 Michael Savage

Date:
 October 26, 2010

Subject:
 Kress Creek/West Branch Remedial Action
 Project – Reach 7

ARCADIS Project No.:
 B0071034.0000

We are sending you:
 Attached

Under Separate Cover Via _____ the Following Items:

- | | | | |
|--|----------------------------------|---|---------------------------------------|
| <input type="checkbox"/> Shop Drawings | <input type="checkbox"/> Plans | <input type="checkbox"/> Specifications | <input type="checkbox"/> Change Order |
| <input type="checkbox"/> Prints | <input type="checkbox"/> Samples | <input type="checkbox"/> Copy of Letter | <input type="checkbox"/> Reports |
| <input checked="" type="checkbox"/> Other: Reach 7 Overburden Lift Radiological Sample Results | | | |

Copies	Date	Drawing No.	Rev.	Description	Action*
Reach 7					
1	10/26/2010	Pile # KC-R7-OB12		KC-R7-OB12-A through KC-R7-OB12-E (and one QC-A sample)	F
1	10/26/2010	Pile # KC-R7-OB13		KC-R7-OB13-A through KC-R7-OB13-E (and one QC-B sample)	F
1	10/26/2010	Pile # KC-R7-OB14		KC-R7-OB14-A through KC-R7-OB14-E (and one QC-A sample)	F
1	10/26/2010	Pile # KC-R7-OB15		KC-R7-OB15-A through KC-R7-OB15-E (and one QC-C sample)	F
1	10/26/2010	Pile # KC-R7-OB16		KC-R7-OB16-A through KC-R7-OB16-E (and one QC-B sample)	F
1	10/26/2010	Pile # KC-R7-OB17		KC-R7-OB17-A through KC-R7-OB17-E (and one QC-E sample)	F
1	10/26/2010	Pile # KC-R7-OB18		KC-R7-OB18-A through KC-R7-OB18-E (and one QC-B sample)	F
1	10/26/2010	Pile # KC-R7-OB19		KC-R7-OB19-A through KC-R7-OB19-E (and one QC-A sample)	F
1	10/26/2010	Pile # KC-R7-OB20		KC-R7-OB20-A through KC-R7-OB20-E (and one QC-C sample)	F
1	10/26/2010	Pile # KC-R7-OB22		KC-R7-OB22-A through KC-R7-OB22-E (and one QC-A sample)	F
1	10/26/2010	Pile # KC-R7-OB23		KC-R7-OB23-A through KC-R7-OB23-E (and one QC-C sample)	F

6.2-1 MFS 11/10/2011



Infrastructure, environment, buildings

Copies	Date	Drawing No.	Rev.	Description	Action*
1	10/26/2010	N/A		Reach 7 Overburden Piles Tracking Spreadsheet for 2010	F

Action*

- A Approved
 AN Approved As Noted
 AS As Requested
 Other:

- CR Correct and Resubmit
 F File
 FA For Approval

- Resubmit _____ Copies
 Return _____ Copies
 Review and Comment

Mailing Method

- U.S. Postal Service 1st Class Courier/Hand Delivery FedEx Priority Overnight FedEx 2-Day Delivery
 Certified/Registered Mail United Parcel Service (UPS) FedEx Standard Overnight FedEx Economy
 Other:

Comments: _____

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Monday, October 25, 2010 9:18 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-092110-OB-12A Verification
Attachments: KC-R7-092110-OB-12A_1051.pdf

Mike,

Please find the verification information for OB lift #KC-R7-092110-OB-12A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMO
THY FISCHER/R5/USEPA/US on 10/25/2010 09:16 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/14/2010 05:42 PM
Subject: Overburden Lift #KC-R7-092110-OB-12A Verification

On 9/21/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-092110-OB-12A which was laid out in the East Overburden Lay-down area. Lift 12A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 9/21/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 80' wide by 120' long. 11 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 9/22/10 at 09:00 hrs under COC #1-1051. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-030. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 2894 cpm
Gamma Count Rate Range : 2067 - 5446 cpm
Gamma Count Rate STD DEV : 573 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 10/14/10)

Sample concentration Average: 1.51 pCi/g
Sample concentration Range : 0.94 – 1.94 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

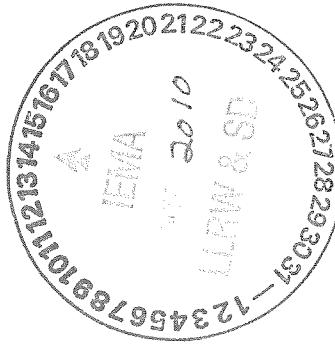
Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

Parcel Number:	11051	Kress Creek Reach 7 Overburden Lift #KC-R7-092110-OB-12A (East Area): COC# 1-1051, September 21, 2010	Bi-214	Pb-214									TOTAL
Sample I.D.	Grid #	Sample Point	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
104129	1-E	COMPOSITE	1.21	0.14	1.40	0.33	1.48	0.09	0.45	0.06	0.42	0.05	1.40
104130	2-E	COMPOSITE	0.87	0.11	0.93	0.35	1.00	0.08	0.47	0.05	0.43	0.05	0.45
104131	3-E	COMPOSITE	0.85	0.11	0.89	0.32	0.89	0.08	0.51	0.06	0.43	0.05	1.34
104132	4-E	COMPOSITE	0.86	0.10	0.71	0.28	1.00	0.08	0.39	0.05	0.38	0.05	0.94
104133	5-E	COMPOSITE	0.64	0.09	0.77	0.31	0.80	0.07	0.36	0.04	0.34	0.04	0.35
104134	6-E	COMPOSITE	0.88	0.10	0.74	0.40	1.08	0.08	0.42	0.05	0.42	0.05	0.99
104136	7-E	COMPOSITE	0.48	0.07	0.68	0.27	0.53	0.07	0.48	0.05	0.37	0.05	0.51
104137	8-E	COMPOSITE	1.27	0.13	1.17	0.32	1.36	0.09	0.67	0.07	0.58	0.06	1.32
104138	9-E	COMPOSITE	0.64	0.09	0.60	0.31	0.74	0.08	1.26	0.09	1.12	0.09	1.19
104139	10-E	COMPOSITE	1.24	0.15	1.36	0.36	1.49	0.10	0.59	0.06	0.47	0.06	1.41

INFORMATION
ONLY

Lift Average

1.51



Stephanie Babbitt

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 9/21/2010

PILE # : KC-R7-OB12 Est. Volume of Pile in Cubic Yards: 170

Number of Samples
 Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Ra 232)	S_2	S_{dup}
KC-R7-OB12-A	1.46					
KC-R7-OB12-B	1.71					
KC-R7-OB12-C	1.55					
KC-R7-OB12-D	1.72					
KC-R7-OB12-E	1.70					
<u>KC-R7-OB12-F (QCA)</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>1.55</u>	<u>0.24</u>	<u>0.18</u>
Number of Samples (n)	<u>5</u>					
Average (Mean of the sample population) (X bar)	<u>1.63</u>					

U_{α} (True Mean) = (X bar) + (t^* * (S_1/\sqrt{n}))

Where " t^* " is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6

Release Criteria

7.20

$U_{\alpha} < \text{Release Criteria?}$

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
 LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
 AS ON SITE BACKFILL PER SOP-214

Michael F. Swayze 09/21/10

Mark H. Henn 10-2-10

Name/date

REVIEWED: SES/ARCADIS

APPROVED: OFFSITES MANAGER:

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Monday, October 25, 2010 9:19 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-092210-OB-13A Verification
Attachments: KC-R7-092210-OB-13A_1052.pdf

Mike,

Please find the verification information for OB lift #KC-R7-092210-OB-13A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/25/2010 09:18 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/14/2010 06:01 PM
Subject: Overburden Lift #KC-R7-092210-OB-13A Verification

On 9/22/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-092210-OB-13A which was laid out in the West Overburden Lay-down area. Lift 13A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 9/22/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 Nal(TL) detector. The total lift area was approximately 60' wide by 120' long. 8 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 9/23/10 at 09:00 hrs under COC #1-1052. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-031. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 3241 cpm
Gamma Count Rate Range : 2311 - 5672 cpm
Gamma Count Rate STD DEV : 605 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 10/14/10)

Sample concentration Average: 1.91 pCi/g
Sample concentration Range : 1.09 – 4.36 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

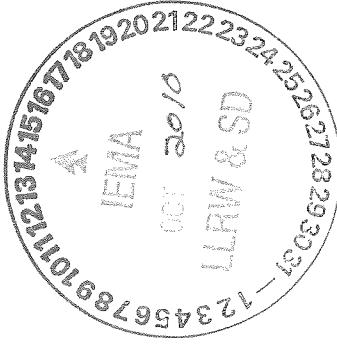
Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

Parcel Number:	Grid #	Sample Point	'Tl-208			Bi-212			Ac-228			Bi-214			Pb-214			Ra-228			Ra-226		
			Result	Error	Result	Result	Error	Result	Result	Error	Result	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
104140	1-W	COMPOSITE	0.70	0.09	0.66	0.31	0.85	0.07	0.36	0.05	0.36	0.05	0.79	0.05	0.36	0.05	0.79	0.05	0.79	0.05	0.79	0.05	1.15
104141	2-W	COMPOSITE	3.45	0.29	3.68	0.55	3.90	0.17	0.63	0.08	0.54	0.08	3.77	0.59	0.59	0.08	3.77	0.59	3.77	0.59	3.77	0.59	4.36
104142	3-W	COMPOSITE	1.50	0.17	1.67	0.43	1.68	0.11	0.63	0.07	0.53	0.07	1.62	0.58	1.62	0.58	1.62	0.58	1.62	0.58	1.62	0.58	2.20
104143	4-W	COMPOSITE	0.74	0.10	0.78	0.31	0.91	0.08	0.49	0.06	0.48	0.06	0.84	0.06	0.84	0.06	0.84	0.06	0.84	0.06	0.84	0.06	1.33
104144	5-W	COMPOSITE	0.70	0.09	0.58	0.25	0.73	0.07	0.39	0.05	0.37	0.05	0.71	0.05	0.71	0.05	0.71	0.05	0.71	0.05	0.71	0.05	1.09
104146	6-W	COMPOSITE	0.73	0.11	0.69	0.27	0.86	0.08	0.87	0.07	0.84	0.07	0.80	0.07	0.80	0.07	0.80	0.07	0.80	0.07	0.80	0.07	1.65
104147	7-W	COMPOSITE	0.92	0.11	1.00	0.41	1.10	0.09	0.56	0.06	0.48	0.06	1.03	0.52	1.03	0.52	1.03	0.52	1.03	0.52	1.03	0.52	1.55

Lift Average
 1.91

INFORMATION
REPORT



Kylee Bough

OVERBURDEN PILE SAMPLING

Excavation Area:	Reach 7				
Date Sampled:	9/22/2010				
PILE # : KC-R7-OB13		Est. Volume of Pile in Cubic Yards: 188			
Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB13-A	1.45				
KC-R7-OB13-B	2.09				
KC-R7-OB13-C	2.01				
KC-R7-OB13-D	2.68				
KC-R7-OB13-E	1.96				
KC-R7-OB13-F (QC-B)					
Number of Samples (n)	5	3.12	0.30	0.12	0.21
Average (Mean of the sample population) (X bar)	2.04				
Check if QC Sample Dup. is within 3 Standard Deviations ($3 S_{dup}$) of the mean of the sample population, per SOP 214, paragraph 11.1					
Standard Deviation of sample population (S_1)	0.39	$t_{\alpha/2}^{\prime \prime}$ value 2.732		$3 \times S_{dup} =$ 1.33	
$U_{\alpha} (\text{True Mean}) = (X \text{ bar}) + (t_{\alpha/2} \cdot (S_1 / \sqrt{n}))$ Where " $t_{\alpha/2}$ " is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	2.41		Mean + 3 $S_{dup} =$ 3.37	$QC < (\text{Mean} + 3S_{dup})?$ QC > ($\text{Mean} - 3S_{dup}$)?	O.K.
Release Criteria	7.20		Mean - 3 $S_{dup} =$ 0.71		O.K.
SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214					
REVIEWED: SES/ARCADIS	<u>Dick J-25-10</u> Michael F. Savage 09/29/10				
APPROVED: OFFSITES MANAGER:	<u>Tom Johnson</u> 10-7-10				

Number of Samples
Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB13-A	1.45				
KC-R7-OB13-B	2.09				
KC-R7-OB13-C	2.01				
KC-R7-OB13-D	2.68				
KC-R7-OB13-E	1.96				
KC-R7-OB13-F (QC-B)					
Number of Samples (n)	5	3.12	0.30	0.12	0.21
Average (Mean of the sample population) (X bar)	2.04				

$S_{dup} = \sqrt{(S_1^2 + S_2^2)} = 0.44$	
---	--

Check if QC Sample Dup. is within 3 Standard Deviations ($3 S_{dup}$) of the mean of the sample population, per SOP 214, paragraph 11.1	
---	--

Name/date

Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Monday, October 25, 2010 9:21 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-092410-OB-14A Verification
Attachments: KC-R7-092410-OB-14A_1053.pdf

Mike,

Please find the verification information for OB lift #KC-R7-092410-OB-14A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/25/2010 09:20 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/15/2010 03:17 PM
Subject: Overburden Lift #KC-R7-092410-OB-14A Verification

On 9/24/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-092410-OB-14A which was laid out in the North Overburden Lay-down area. Lift 14A was surveyed as a whole 6" lift. The lay-down area was segregated into 8 grids and was designated as a 6" lift (A-level) on 9/24/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 45' wide by 200' long. 9 samples were collected. The samples were submitted to the WCL on 9/24/10 at 16:20 hrs under COC #1-1053. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-033. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 4115 cpm
Gamma Count Rate Range : 2481 - 7267 cpm
Gamma Count Rate STD DEV : 866 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 10/15/10)

Sample concentration Average: 4.30 pCi/g
Sample concentration Range : 2.49 – 5.46 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
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(630) 293-6378 West Chicago Office
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(630) 632-5819 Cell

Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

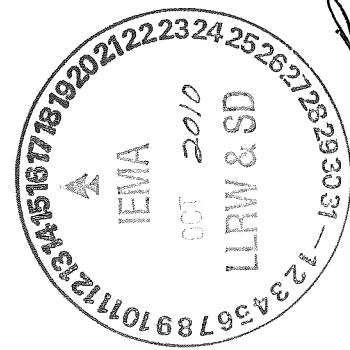
Parcel Number: 11053 Kress Creek Reach 7 Overburden Lift #KC-R7-092410-OB-14A (North Area): COC# 1-1053, September 24, 2010

Sample I.D.	Grid #	Sample Point	Result	Error	TOTAL																
104148	1-N	COMPOSITE	3.29	0.31	3.41	0.70	3.64	0.19	1.83	0.14	2.04	0.16	3.53	1.92	5.46						
104149	2-N	COMPOSITE	3.00	0.28	3.05	0.66	3.54	0.19	1.74	0.14	1.51	0.12	3.35	1.61	4.95						
104150	3-N	COMPOSITE	1.36	0.16	1.54	0.44	1.49	0.11	1.59	0.11	1.60	0.12	1.45	1.60	3.05						
104151	4-N	COMPOSITE	1.46	0.16	1.81	0.44	1.65	0.12	0.99	0.09	0.80	0.09	1.60	0.89	2.49						
104152	5-N	COMPOSITE	2.64	0.26	2.16	0.66	3.28	0.18	1.11	0.10	0.97	0.10	3.03	1.04	4.07						
104153	6-N	COMPOSITE	2.89	0.29	2.92	0.67	3.51	0.19	1.48	0.13	1.38	0.12	3.31	1.43	4.73						
104154	7-N	COMPOSITE	2.92	0.28	3.53	0.62	4.04	0.20	1.11	0.12	1.14	0.12	3.66	1.12	4.78						
104156	8-N	COMPOSITE	2.94	0.29	3.47	0.76	3.59	0.20	1.52	0.13	1.44	0.13	3.39	1.48	4.87						

**INFORMATION
ONLY**

Lift Average

4.30



Stacy L. Babbitt

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 9/24/2010

PILE #: KC-R7-OB14 Est. Volume of Pile in Cubic Yards: 130

Number of Samples
5
Required Per SOP 214:

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	S_2	S_{dup}
KC-R7-OB14-A	3.92					
KC-R7-OB14-B	3.25					
KC-R7-OB14-C	2.24					
KC-R7-OB14-D	3.12					
KC-R7-OB14-E	3.59					
KC-R7-OB14-F (QCA)		4.51			0.35	0.20
					0.28	
Number of Samples (n)	<u>5</u>					
Average (Mean of the sample population) (X bar)	<u>3.23</u>					

Average of samples is <7.2 pCi/g, Proceed with Confidence Level Check described in
SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_1)	0.57	"t" value	1.89
U_α (True Mean) = $(X \text{ bar}) + (t * (S_1 / \sqrt{n}))$	3.77	2.132	
Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6			
Release Criteria	7.20		
SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214			

$U_\alpha <$ Release Criteria?

✓ *Michael Sandoval 09/29/10*

REVIEWED: SES/ARCADIS

APPROVED: OFFSITES MANAGER:

✓ *Michael Sandoval 10-2-10*

Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Monday, October 25, 2010 9:23 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-092710-OB-15A Verification

Mike,

Please find the verification information for OB lift #KC-R7-092710-OB-15A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/25/2010 09:22 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/14/2010 06:19 PM
Subject: Overburden Lift #KC-R7-092710-OB-15A Verification

On 9/27/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-092710-OB-15A which was laid out in the West Overburden Lay-down area. Lift 15A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 9/27/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 60' wide by 120' long. 7 samples were collected. The samples were submitted to the WCL on 9/27/10 at 15:05 hrs under COC #1-1054. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-035. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 4174 cpm
Gamma Count Rate Range : 2687 - 7843 cpm
Gamma Count Rate STD DEV : 1025 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 10/14/10)

Sample concentration Average: 3.91 pCi/g
Sample concentration Range : 2.41 – 5.13 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

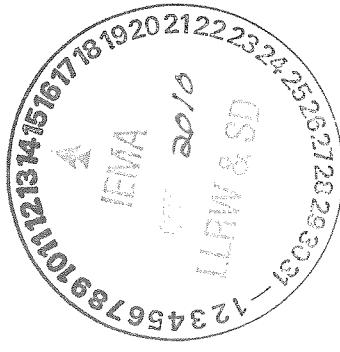
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Parcel Number:	11054	Kress Creek Reach 7 Overburden Lift #KC-R7-092710-OB-15A (West Area): COC# 1-1054, September 27, 2010																		
Sample I.D.	Grid #	Sample Point	Result	Error	Result	Total														
104157	1-W	COMPOSITE	3.80	0.34	4.57	0.77	4.12	0.21	1.16	0.11	0.99	0.11	4.06	1.07	5.13					
104158	2-W	COMPOSITE	3.18	0.29	4.09	0.68	3.84	0.19	1.24	0.10	1.00	0.10	3.67	1.12	4.78					
104159	3-W	COMPOSITE	3.08	0.28	4.23	0.70	3.78	0.20	0.89	0.10	0.89	0.10	3.58	0.89	4.47					
104160	4-W	COMPOSITE	1.69	0.18	1.74	0.43	1.81	0.13	0.67	0.08	0.62	0.08	1.76	0.64	2.41					
104161	5-W	COMPOSITE	2.96	0.28	3.20	0.64	3.46	0.18	1.04	0.10	0.92	0.10	3.30	0.98	4.28					
104162	6-W	COMPOSITE	1.79	0.20	2.18	0.59	2.21	0.14	0.87	0.09	0.70	0.08	2.07	0.77	2.85					
104163	7-W	COMPOSITE	2.45	0.23	2.93	0.51	2.72	0.14	0.81	0.09	0.75	0.08	2.66	0.77	3.43					

INFORMATION
ONLY

Lift Average

3.91



Heath Stohler

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 9/25/2010

PILE #: KC-R7-OB15 Est. Volume of Pile in Cubic Yards: 188

Number of Samples
Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB15-A	3.21					
KC-R7-OB15-B	3.96					
KC-R7-OB15-C	3.20					
KC-R7-OB15-D	5.43					
KC-R7-OB15-E	3.31					
KC-R7-OB15-F (QC-C)	-----					
		3.86	0.34	0.16	0.25	

$S_{dup} = \sqrt{S_1^2 + S_2^2} =$

0.89

Check if QC Sample Dup. is within 3 Standard Deviations (3 S_{dup}) of the mean of the sample population, per SOP 214, paragraph 11.1	
$3 \times S_{dup} =$	<u>2.66</u>

Mean + 3 S_{dup} =	<u>6.48</u>	QC < (Mean + 3 S_{dup})?	<u>O.K.</u>
Mean - 3 S_{dup} =	<u>1.16</u>	QC > (Mean - 3 S_{dup})?	<u>O.K.</u>

AVERAGE OF SAMPLES IS <7.2 pCi/g. PROCEED WITH CONFIDENCE LEVEL CHECK DESCRIBED IN SOP-214, PARAGRAPH 6.12	
STANDARD DEVIATION OF SAMPLE POPULATION (S_1)	0.85
U _a (TRUE MEAN) = (X BAR) + (t * (S ₁ /sqrt(n))) Where "t" is a statistic used for small sample tests or hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	4.63 "t" value 2.132
RELEASE CRITERIA	7.20
SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214	

U_a < Release Criteria?

Michael F. Spiegel 9/29/10

John Allen 10-2-10

Name/date

REVIEWED: SES/ARCADIS

APPROVED: OFFSITES MANAGER:

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Monday, October 25, 2010 9:24 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-092810-OB-16A Verification
Attachments: KC-R7-092810-OB-16A_1055.pdf

Mike,

Please find the verification information for OB lift #KC-R7-092810-OB-16A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/25/2010 09:23 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/22/2010 04:52 PM
Subject: Overburden Lift #KC-R7-092810-OB-16A Verification

On 9/28/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-092810-OB-16A which was laid out in the East Overburden Lay-down area. Lift 16A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 9/28/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 80' wide by 120' long. 12 samples were collected with 2 of the samples being duplicates. The samples were submitted to the WCL on 9/28/10 at 16:40 hrs under COC #1-1055. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-036. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 4034 cpm
Gamma Count Rate Range : 2581 - 5508 cpm
Gamma Count Rate STD DEV : 570 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 10/22/10)

Sample concentration Average: 3.92 pCi/g
Sample concentration Range : 2.47 – 6.59 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

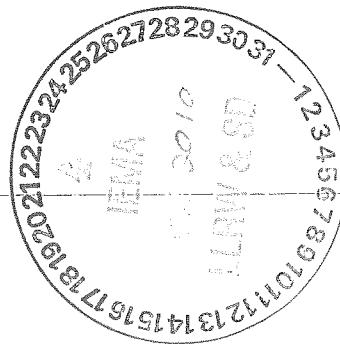
Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

Parcel Number:	11055	Kress Creek Reach 7 Overburden Lift #KC-R7-092810-OB-16A (East Area): COC# 1-1055, September 28, 2010	Tl-208	Bi-212	Ac-228	Bi-214	Pb-214	Result	Error	Result	Error	Result	Error	Result	Error	Ra-228	Ra-226	TOTAL
Sample I.D.	Grid #	Sample Point	Result	Error														
104164	1-E	COMPOSITE	2.20	0.26	2.31	0.62	2.58	0.19	1.03	0.12	0.88	0.10	2.44	0.95	3.40			
104166	2-E	COMPOSITE	1.94	0.23	2.26	0.57	2.26	0.17	0.80	0.12	0.71	0.10	2.15	0.74	2.90			
104167	3-E	COMPOSITE	3.36	0.37	3.71	0.87	3.81	0.26	0.96	0.15	0.81	0.15	3.66	0.89	4.55			
104168	4-E	COMPOSITE	2.07	0.25	2.45	0.76	2.34	0.17	0.75	0.11	0.65	0.10	2.26	0.70	2.96			
104169	5-E	COMPOSITE	4.50	0.37	5.13	0.81	5.18	0.24	1.73	0.14	1.48	0.13	5.00	1.59	6.59			
104170	6-E	COMPOSITE	1.76	0.23	1.90	0.58	2.00	0.17	0.55	0.10	0.56	0.10	1.91	0.56	2.47			
104171	7-E	COMPOSITE	3.25	0.29	3.66	0.70	3.54	0.20	0.81	0.09	0.78	0.10	3.46	0.80	4.25			
104172	8-E	COMPOSITE	3.21	0.31	4.07	0.75	3.74	0.20	0.80	0.10	0.71	0.10	3.61	0.76	4.36			
104173	9-E	COMPOSITE	2.18	0.29	2.25	0.72	2.50	0.20	0.87	0.11	0.80	0.12	2.39	0.84	3.22			
104174	10-E	COMPOSITE	3.24	0.37	4.52	0.84	3.65	0.25	1.01	0.13	0.92	0.14	3.58	0.97	4.54			

INFORMATION
ONLY

Lift Average

3.92



Stephanie Johnson

OVERBURDEN PILE SAMPLING

Excavation Area: _____ Reach 7
 Date Sampled: _____ 9/27/2010

PILE #: KC-R7-OB16 Est. Volume of Pile in Cubic Yards: _____ 170

Number of Samples Required Per SOP 214:
 5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	S_2	S_{dup}
KC-R7-OB16-A	3.10					
KC-R7-OB16-B	3.51					
KC-R7-OB16-C	3.05					
KC-R7-OB16-D	4.30					
KC-R7-OB16-E	4.49					
KC-R7-OB16-F (QC-B)	_____	3.19	0.32	0.15	0.24	
Number of Samples (n)	5					
Average (Mean of the sample population) (X bar)	3.69					

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12	Standard Deviation of sample population (S_1)	0.60	"t" value	2.132	Mean + 3 S_{dup} =	5.63	QC < (Mean + 3 S_{dup})?	O.K.
	U _α (True Mean) = (X bar) + (t * (S ₁ /sqrt(n)))	4.27			Mean - 3 S_{dup} =	1.75	QC > (Mean - 3 S_{dup})?	O.K.
	Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6							
	Release Criteria	7.20						
	SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214							
U _α < Release Criteria?								

REVIEWED: SES/ARCADIS
 APPROVED: OFFSITES MANAGER:

D.G.H. 9.29.10 / Michael F. Souff 09/29/10

Name/date
John M. 10-2-10

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Monday, October 25, 2010 9:28 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-093010-OB-17A Verification
Attachments: KC-R7-093010-OB-17A_1057.pdf

Mike,

Please find the verification information for OB lift #KC-R7-093010-OB-17A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/25/2010 09:28 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/20/2010 05:02 PM
Subject: FW: Overburden Lift #KC-R7-093010-OB-17A Verification

Please see attached Sample Results

From: Shafer, Steve
Sent: Wednesday, October 20, 2010 5:02 PM
To: Runyon, Tim; 'Fischer.Timothy@epamail.epa.gov'
Subject: Overburden Lift #KC-R7-093010-OB-17A Verification

On 9/30/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-093010-OB-17A which was laid out in the North Overburden Lay-down area. Lift 17A was surveyed as a whole 6" lift. The lay-down area was segregated into 8 grids and was designated as a 6" lift (A-level) on 9/30/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 45' wide by 200' long. 9 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 9/30/10 at 14:05 hrs under COC #1-1057. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-038. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 3988 cpm
Gamma Count Rate Range : 3004 - 5513 cpm
Gamma Count Rate STD DEV : 558 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 10/2010)

Sample concentration Average: 3.38 pCi/g

Sample concentration Range : 2.26 – 4.44 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

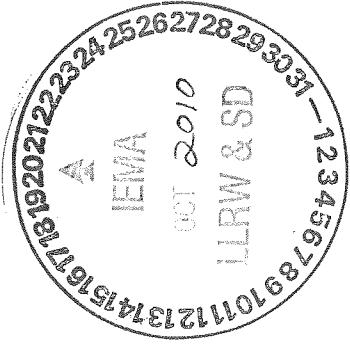
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Parcel Number:	Grid #	Sample Point	COC# 1-1057, September 30, 2010						
			Tl-208	Bi-212	Ac-228	Bi-214	Pb-214	Ra-228	Ra-226
104177	1-N	COMPOSITE	1.79	0.19	1.79	0.44	2.05	0.13	1.05
	2-N	COMPOSITE	2.04	0.21	2.37	0.56	2.43	0.14	2.13
104178	3-N	COMPOSITE	2.03	0.19	1.86	0.50	2.23	0.14	1.01
104179	4-N	COMPOSITE	1.45	0.16	1.76	0.43	1.78	0.12	0.62
104180	5-N	COMPOSITE	3.07	0.27	2.58	0.61	3.10	0.18	1.03
104181	6-N	COMPOSITE	1.73	0.18	2.49	0.45	1.98	0.12	0.66
104182	7-N	COMPOSITE	1.96	0.19	1.79	0.49	2.29	0.14	0.69
104183	8-N	COMPOSITE	3.49	0.31	3.69	0.66	3.61	0.20	1.11
104184									

INFORMATION
ONLY

Lift Average

3.38



Stephen Blodgett

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 9/29/2010
 PILE #: KC-R7-OB17

Est. Volume of Pile in Cubic Yards: 130

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	S ₂	S _{dup}
KC-R7-OB17-A	3.49				
KC-R7-OB17-B	2.80				
KC-R7-OB17-C	2.51				
KC-R7-OB17-D	3.19				
KC-R7-OB17-E	3.53				
KC-R7-OB17-F (QC-E)	-----	3.66	0.34	0.15	0.25
Number of Samples (n)	5				
Average (Mean of the sample population) (\bar{X} bar)	3.10				

Average of samples is ≤ 7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_r)

$$U_{\alpha} (\text{True Mean}) = (\bar{X} \text{ bar}) + (t^* (S_r / \sqrt{n}))$$

Where " t^* " is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6

Release Criteria

$$U_{\alpha} < \text{Release Criteria?}$$

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
AS ON SITE BACKFILL PER SOP-214

REVIEWED: SES/ARCADIS

Michael F. Savoff

10/04/2010

APPROVED: OFFSITES MANAGER:

Mark Johnson

10/07/2010

Name/date

Number of Samples
Required Per SOP 214:
5

$S_{\text{dup}} = \sqrt{(S_1^2 + S_2^2)} =$	<u>0.46</u>
Check if QC Sample Dup. is within 3 Standard Deviations ($3 S_{\text{dup}}$) of the mean of the sample population, per SOP 214, paragraph 11.1	
$3 \times S_{\text{dup}} =$	<u>1.39</u>

$$\begin{array}{ll} \text{Mean} + 3 S_{\text{dup}} = & 4.49 \\ \text{Mean} - 3 S_{\text{dup}} = & 1.71 \end{array} \quad \begin{array}{ll} \text{QC} < (\text{Mean} + 3 S_{\text{dup}})? & \text{O.K.} \\ \text{QC} > (\text{Mean} - 3 S_{\text{dup}})? & \text{O.K.} \end{array}$$

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Monday, October 25, 2010 9:26 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-100610-OB-18A Verification
Attachments: KC-R7-100610-OB-18A_1058.pdf

Mike,

Please find the verification information for OB lift #KC-R7-100610-OB-18A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/25/2010 09:25 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/20/2010 09:47 AM
Subject: Overburden Lift #KC-R7-100610-OB-18A Verification

On 10/06/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-100610-OB-18A which was laid out in the West Overburden Lay-down area. Lift 18A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 10/06/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 60' wide by 120' long. 7 samples were collected. The samples were submitted to the WCL on 10/06/10 at 12:05 hrs under COC #1-1058. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-041. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 4328 cpm
Gamma Count Rate Range : 3231 - 5598 cpm
Gamma Count Rate STD DEV : 450 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 10/14/10)

Sample concentration Average: 4.48 pCi/g
Sample concentration Range : 3.92 – 5.10 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
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(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

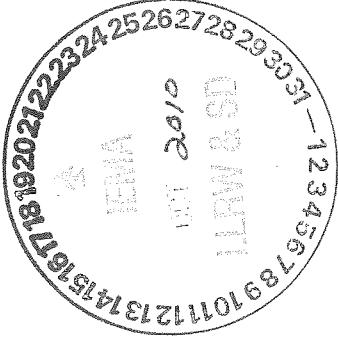
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Sample I.D.	Grid #	Sample Point	Lift #KC-R7-100610-OB-18A (West Area): COC# 1-1058, October 6, 2010						TOTAL						
			Tl-208	Bi-212	Ac-228	Bi-214	Pb-214	Ra-228	Ra-226						
104186	1-W	COMPOSITE	3.01	0.29	3.43	0.63	3.40	0.19	1.01	0.11	0.99	0.11	3.29	1.00	4.29
104187	2-W	COMPOSITE	3.18	0.31	3.24	0.67	3.66	0.20	0.91	0.10	0.78	0.09	3.50	0.84	4.34
104188	3-W	COMPOSITE	3.44	0.32	3.99	0.72	3.78	0.20	1.23	0.12	1.06	0.10	3.70	1.14	4.83
104189	4-W	COMPOSITE	3.22	0.29	3.42	0.64	3.58	0.19	0.88	0.09	0.80	0.10	3.47	0.85	4.32
104190	5-W	COMPOSITE	2.71	0.26	2.86	0.57	3.16	0.17	0.96	0.10	0.86	0.09	3.01	0.91	3.92
104191	6-W	COMPOSITE	2.79	0.26	2.83	0.66	3.23	0.18	2.07	0.14	1.98	0.15	3.07	2.03	5.10
104192	7-W	COMPOSITE	3.08	0.30	3.48	0.67	3.63	0.20	1.27	0.12	0.91	0.11	3.46	1.08	4.54

INFORMATION
ONLY

Lift Average

4.48



Stephen B. Johnson

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 10/6/2010

PILE #: **KC-R7-OB18** Est. Volume of Pile in Cubic Yards: 188

Number of Samples
 Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB18-A	4.49					
KC-R7-OB18-B	4.10					
KC-R7-OB18-C	4.36					
KC-R7-OB18-D	4.19					
KC-R7-OB18-E	4.05					
KC-R7-OB18-F (QC-B)	3.48	3.33	0.15	0.24		

Number of Samples (n)

5

Average (Mean of the sample population) (\bar{X} bar)

4.24

Average of samples is <7.2 pCi/g, Proceed with Confidence Level Check described in

SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_1)

0.16

U_α (True Mean) = (\bar{X} bar) + (t^* * (S_1/\sqrt{n}))
 Where " t^* " is a statistic used for small sample tests
 of hypotheses (the Student Distribution), from
 SOP No. KMS-102, Attachment 10.6

Release Criteria

7.20

U_a < Release Criteria?
 t^* value
 2.132

$3 \times S_{dup} =$	0.88
Mean + 3 $S_{dup} =$	5.12
Mean - 3 $S_{dup} =$	3.36
QC < (Mean + 3 S_{dup})?	O.K.
QC > (Mean - 3 S_{dup})?	O.K.

**SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
 LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
 AS ON SITE BACKFILL PER SOP-214**

John H. Snell 10/12/2010

John H. Snell 10/12/2010

REVIEWED: SES/ARCADIS

APPROVED: OFFSITES MANAGER:

Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Monday, October 25, 2010 9:32 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-100810-OB-19A Verification
Attachments: KC-R7-100810-OB-19A_1059.pdf

Mike,

Please find the verification information for OB lift #KC-R7-100810-OB-19A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/25/2010 09:31 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/18/2010 08:03 AM
Subject: Overburden Lift #KC-R7-100810-OB-19A Verification

On 10/08/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-100810-OB-19A which was laid out in the East Overburden Lay-down area. Lift 19A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 10/08/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 80' wide by 120' long. 11 samples were collected with 1 of the samples being a duplicate. The samples were submitted to the WCL on 10/08/10 at 16:20 hrs under COC #1-1059. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-043. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 4232 cpm
Gamma Count Rate Range : 2981 - 5703 cpm
Gamma Count Rate STD DEV : 413 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 10/14/10)

Sample concentration Average: 5.14 pCi/g
Sample concentration Range : 4.10 – 6.06 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

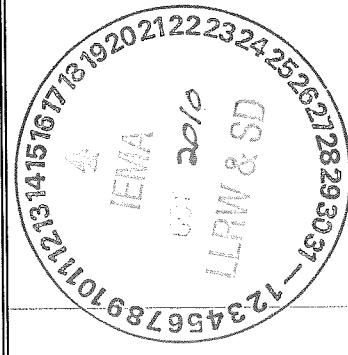
Parcel Number: 11059 Kress Creek Reach 7 Overburden Lift #KC-R7-100810-OB-19A (East Area): COC# 1-1059, October 10, 2010

Sample I.D.	Grid #	Sample Point	Result	Error	TOTAL												
104193	1-E	COMPOSITE	3.76	0.34	3.95	0.70	4.22	0.20	0.99	0.11	0.96	0.10	4.09	0.97	5.07		
104194	2-E	COMPOSITE	2.66	0.30	3.02	0.87	2.98	0.22	1.18	0.14	1.29	0.14	2.87	1.23	4.10		
104196	3-E	COMPOSITE	3.48	0.30	3.40	0.61	3.95	0.19	1.03	0.10	0.92	0.10	3.78	0.97	4.76		
104197	4-E	COMPOSITE	3.52	0.39	3.49	1.05	4.12	0.27	1.11	0.14	1.03	0.15	3.91	1.08	4.99		
104198	5-E	COMPOSITE	3.50	0.31	3.54	0.63	4.03	0.19	1.04	0.10	0.97	0.10	3.86	1.00	4.86		
104199	6-E	COMPOSITE	3.62	0.32	3.94	0.72	4.26	0.20	0.93	0.11	0.96	0.10	4.07	0.94	5.02		
104200	7-E	COMPOSITE	3.25	0.29	3.48	0.74	4.46	0.21	1.48	0.13	1.28	0.12	4.01	1.37	5.37		
104201	8-E	COMPOSITE	3.58	0.32	4.19	0.79	4.76	0.22	1.79	0.15	1.60	0.13	4.36	1.68	6.05		
104202	9-E	COMPOSITE	3.30	0.31	3.98	0.72	4.31	0.21	2.32	0.16	1.85	0.15	3.98	2.08	6.06		
104203	10-E	COMPOSITE	3.49	0.31	3.50	0.69	4.70	0.22	0.90	0.10	0.80	0.10	4.26	0.85	5.10		

**INFORMATION
ONLY**

Lift Average

5.14



Stephanie Schaffer

OVERBURDEN PILE SAMPLING

Excavation Area:	Reach 7																																																																						
Date Sampled:	10/8/2010																																																																						
PILE # : KC-R7-OB19																																																																							
Est. Volume of Pile in Cubic Yards:	170																																																																						
Number of Samples Required Per SOP 214: 5																																																																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Sample #</th> <th style="width: 20%;">Total Radium in pCi/g (Th 232 + Ra 226)</th> <th style="width: 20%;">QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)</th> <th style="width: 20%;">2 sigma uncertainty (Ra 226)</th> <th style="width: 20%;">2 sigma uncertainty (Th 232)</th> </tr> </thead> <tbody> <tr> <td>KC-R7-OB19-A</td> <td>4.68</td> <td></td> <td></td> <td></td> </tr> <tr> <td>KC-R7-OB19-B</td> <td>4.20</td> <td></td> <td></td> <td></td> </tr> <tr> <td>KC-R7-OB19-C</td> <td>4.59</td> <td></td> <td></td> <td></td> </tr> <tr> <td>KC-R7-OB19-D</td> <td>3.59</td> <td></td> <td></td> <td></td> </tr> <tr> <td>KC-R7-OB19-E</td> <td>3.62</td> <td></td> <td></td> <td></td> </tr> <tr> <td>KC-R7-OB19-F (QC-A)</td> <td>-----</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Average (Mean of the sample population) (X bar)</td> <td>5</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Average (Mean of the sample population) (X bar)</td> <td>4.14</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Standard Deviation of sample population (S_x)</td> <td>0.46</td> <td></td> <td></td> <td></td> </tr> <tr> <td>U_{α} (True Mean) = $(X \bar{ }) + (t * (S_x / \sqrt{n}))$ Where "t" is a statistic used for small sample tests or hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6</td> <td>4.58</td> <td>"t" value 2.132</td> <td></td> <td></td> </tr> <tr> <td>Release Criteria</td> <td>7.20</td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="5" style="text-align: center; padding-top: 10px;"> SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214 </td> </tr> <tr> <td>U_α < Release Criteria?</td> <td colspan="4" style="text-align: center;"> <input checked="" type="checkbox"/> Michael F. Savag 10/12/2010 <input type="checkbox"/> John 10-12-10 </td> </tr> </tbody> </table>		Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	KC-R7-OB19-A	4.68				KC-R7-OB19-B	4.20				KC-R7-OB19-C	4.59				KC-R7-OB19-D	3.59				KC-R7-OB19-E	3.62				KC-R7-OB19-F (QC-A)	-----				Average (Mean of the sample population) (X bar)	5				Average (Mean of the sample population) (X bar)	4.14				Standard Deviation of sample population (S_x)	0.46				U_{α} (True Mean) = $(X \bar{ }) + (t * (S_x / \sqrt{n}))$ Where "t" is a statistic used for small sample tests or hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	4.58	"t" value 2.132			Release Criteria	7.20				SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214					U _α < Release Criteria?	<input checked="" type="checkbox"/> Michael F. Savag 10/12/2010 <input type="checkbox"/> John 10-12-10			
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Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	Std. Dev. for the analyses of the duplicate sample	Std. Dev. of the duplicate sampling & measurement									
KC-R7-OB19-A	4.68														
KC-R7-OB19-B	4.20														
KC-R7-OB19-C	4.59														
KC-R7-OB19-D	3.59														
KC-R7-OB19-E	3.62														
KC-R7-OB19-F (QC-A)	-----														
Average (Mean of the sample population) (X bar)	5														
Average (Mean of the sample population) (X bar)	4.14														
Standard Deviation of sample population (S_x)	0.46														
U_{α} (True Mean) = $(X \bar{ }) + (t * (S_x / \sqrt{n}))$ Where "t" is a statistic used for small sample tests or hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	4.58	"t" value 2.132													
Release Criteria	7.20														
Check if QC Sample Dup. is within 3 Standard Deviations (3 S_{dup}) of the mean of the sample population, per SOP 214, paragraph 11.1															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">3 x S_{dup} =</td> <td style="width: 30%;">1.55</td> <td style="width: 40%;"></td> </tr> <tr> <td>Mean + 3 S_{dup} =</td> <td>5.68</td> <td>QC < (Mean + 3 S_{dup})? O.K.</td> </tr> <tr> <td>Mean - 3 S_{dup} =</td> <td>2.59</td> <td>QC > (Mean - 3 S_{dup})? O.K.</td> </tr> </table>							3 x S_{dup} =	1.55		Mean + 3 S_{dup} =	5.68	QC < (Mean + 3 S_{dup})? O.K.	Mean - 3 S_{dup} =	2.59	QC > (Mean - 3 S_{dup})? O.K.
3 x S_{dup} =	1.55														
Mean + 3 S_{dup} =	5.68	QC < (Mean + 3 S_{dup})? O.K.													
Mean - 3 S_{dup} =	2.59	QC > (Mean - 3 S_{dup})? O.K.													

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Monday, October 25, 2010 9:33 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-101110-OB-20A Verification
Attachments: KC-R7-101110-OB-20A_1060.pdf

Mike,

Please find the verification information for OB lift #KC-R7-101110-OB-20A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/25/2010 09:32 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/22/2010 04:34 PM
Subject: Overburden Lift #KC-R7-101110-OB-20A Verification

On 10/11/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-101110-OB-20A which was laid out in the West Overburden Lay-down area. Lift 20A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 10/11/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 Nal(TL) detector. The total lift area was approximately 60' wide by 120' long. 8 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 10/12/10 at 09:15 hrs under COC #1-1060. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-045. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 4116 cpm
Gamma Count Rate Range : 3050 - 5259 cpm
Gamma Count Rate STD DEV : 369 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 10/22/10)

Sample concentration Average: 4.62 pCi/g
Sample concentration Range : 3.79 – 5.69 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

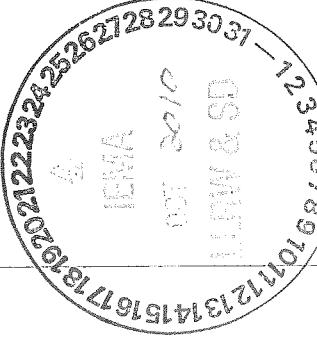
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Parcel Number:	Grid #	Sample Point	TL-208			Bi-212			Ac-228			Bi-214			Pb-214			Ra-228			Ra-226				
			Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
104204	1-W	COMPOSITE	2.71	0.25	2.94	0.56	2.94	0.16	0.91	0.10	0.90	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.91	3.79
104206	2-W	COMPOSITE	2.72	0.26	2.79	0.65	3.05	0.17	1.65	0.12	1.34	0.12	2.94	0.12	1.49	0.12	2.94	0.12	1.49	0.12	2.94	0.12	1.49	0.12	4.43
104207	3-W	COMPOSITE	2.32	0.25	2.84	0.70	3.08	0.18	1.37	0.12	1.46	0.12	2.82	0.12	1.41	0.12	2.82	0.12	1.41	0.12	2.82	0.12	1.41	0.12	4.23
104208	4-W	COMPOSITE	2.51	0.26	2.24	0.61	3.00	0.18	3.16	0.19	2.64	0.18	2.80	0.18	2.89	0.18	2.80	0.18	2.89	0.18	2.89	0.18	2.89	0.18	5.69
104209	5-W	COMPOSITE	2.98	0.28	3.04	0.56	3.20	0.18	1.17	0.11	1.10	0.11	3.13	0.11	1.14	0.11	3.13	0.11	1.14	0.11	3.13	0.11	1.14	0.11	4.27
104210	6-W	COMPOSITE	2.71	0.26	2.77	0.57	2.92	0.18	2.00	0.15	1.79	0.14	2.85	0.14	1.89	0.14	2.85	0.14	1.89	0.14	2.85	0.14	1.89	0.14	4.74
104211	7-W	COMPOSITE	3.28	0.30	3.10	0.75	4.16	0.21	1.53	0.13	1.20	0.11	3.84	0.11	1.34	0.11	3.84	0.11	1.34	0.11	3.84	0.11	1.34	0.11	5.19

INFORMATION
ONLY

Lift Average

4.62



[Handwritten signature]

OVERBURDEN PILE SAMPLING

Excavation Area: _____ Reach 7
 Date Sampled: _____ 10/11/2010
PILE # : KC-R7-OB20 **Est. Volume of Pile in Cubic Yards:** _____ 188

Number of Samples Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	S_2	S_{dup}
KC-R7-OB20-A	4.36					
KC-R7-OB20-B	3.90					
KC-R7-OB20-C	3.16					
KC-R7-OB20-D	3.15					
KC-R7-OB20-E	4.52					
KC-R7-OB20-F (QC-C)	-----	3.33	0.31	0.17	0.24	
Number of Samples (n)	5					
Average (Mean of the sample population) (X bar)	3.82					

Average of samples is <7.2 pCi/g, Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_1)	0.58	"t" value	1.88
U_α (True Mean) = $(X \bar{ }) + (t * (S_1 / \sqrt{n}))$ Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	4.37	2.132	QC < (Mean + 3 S_{dup})? QC > (Mean - 3 S_{dup})?
Release Criteria	7.20	Mean + 3 S_{dup} = 5.70 Mean - 3 S_{dup} = 1.94	O.K. O.K.

U_α < Release Criteria?

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ONSITE BACKFILL PER SOP-214

D. L. H. 10-13-10 / Michael F. Savage 10/13/2010

David H. 10-13-10 / Michael F. Savage 10/13/2010

REVIEWED: SESARADS

Name/date

APPROVED: OFFSITES MANAGER:

Name/date

Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Monday, October 25, 2010 9:34 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-101210-OB-22A Verification
Attachments: KC-R7-101210-OB-22A_1061.pdf

Mike,

Please find the verification information for OB lift #KC-R7-101210-OB-22A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/25/2010 09:34 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/21/2010 11:47 AM
Subject: Overburden Lift #KC-R7-101210-OB-22A Verification

On 10/12/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-101210-OB-22A which was laid out in the West Overburden Lay-down area. Lift 22A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 10/12/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 Nal(TL) detector. The total lift area was approximately 60' wide by 120' long. 8 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 10/13/10 at 09:20 hrs under COC #1-1061. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-046. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 4441 cpm
Gamma Count Rate Range : 2816 - 6373 cpm
Gamma Count Rate STD DEV : 660 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 10/21/10)

Sample concentration Average: 4.45 pCi/g
Sample concentration Range : 2.99 – 5.84 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

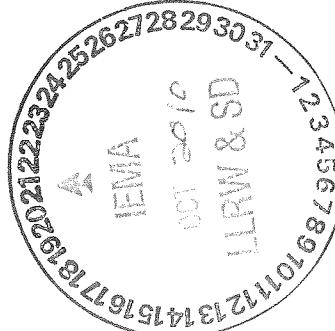
Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

Sample I.D.	Grid #	Sample Point	Result	Error	Tl-208			Bi-212			Ac-228			Bi-214			Pb-214			Ra-228			Ra-226			
					Result	Error	Result	Result	Error	Result	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	
104223	1-W	COMPOSITE	1.84	0.19	1.85	0.52	2.05	0.13	1.16	0.10	0.89	0.09	1.98	1.01	2.99	2.99	1.01	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	
104224	2-W	COMPOSITE	2.56	0.24	2.90	0.55	3.03	0.16	0.80	0.08	0.63	0.08	2.89	0.72	3.61	2.89	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	
104226	3-W	COMPOSITE	2.68	0.27	2.81	0.62	3.18	0.18	2.13	0.15	1.69	0.13	3.02	1.89	4.91	3.02	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89	
104227	4-W	COMPOSITE	4.26	0.37	4.70	0.70	4.81	0.22	0.96	0.12	1.04	0.10	4.67	1.01	5.67	4.67	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	
104228	5-W	COMPOSITE	4.22	0.37	4.18	0.74	4.94	0.23	1.19	0.12	1.10	0.11	4.70	1.14	5.84	4.70	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	
104229	6-W	COMPOSITE	2.41	0.23	2.30	0.56	2.56	0.15	0.78	0.09	0.83	0.09	2.50	0.81	3.31	2.50	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	
104230	7-W	COMPOSITE	3.06	0.29	3.18	0.83	4.16	0.21	1.12	0.12	0.97	0.11	3.77	1.04	4.81	1.04	3.77	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04

INFORMATION
ONLY

Lift Average

4.45



Joseph B. Strohman

OVERBURDEN PILE SAMPLING

Excavation Area: _____ Reach 7
 Date Sampled: _____ 10/12/2010
PILE #: KC-R7-OB22 **Est. Volume of Pile in Cubic Yards:** _____ 188

Number of Samples Required Per SOP 214:
 5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB22-A	5.46					
KC-R7-OB22-B	6.32					
KC-R7-OB22-C	4.40					
KC-R7-OB22-D	3.62					
KC-R7-OB22-E	3.17					
KC-R7-OB22-F (QC-A)	-----					
Number of Samples (n)		6.30	0.54	0.22	0.38	
Average (Mean of the sample population) (X bar)	5					
	4.60					

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_1)	1.16	$t_{\alpha/2}^{(n)}$ value 2.132	$3 \times S_{dup} =$ 3.66	$QC < (Mean + 3S_{dup})?$ 8.26	O.K.
$U_{\alpha} (\text{True Mean}) = (X \text{ bar}) + (t * (S_1 / \sqrt{n}))$ Where $t_{\alpha/2}^{(n)}$ is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	5.70	Mean + 3 $S_{dup} =$ 8.26	Mean - 3 $S_{dup} =$ 0.94	$QC > (Mean - 3S_{dup})?$ O.K.	

Release Criteria
7.20

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
AS ON SITE BACKFILL PER SOP-214

$U_{\alpha} < \text{Release Criteria?}$

REVIEWED: SES/ARCADIS

Michael F. Savage 10/15/2010

APPROVED: OFFSITES MANAGER:

Michael F. Savage 10/15/2010

Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Monday, October 25, 2010 9:35 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-101410-OB-23A Verification
Attachments: KC-R7-101410-OB-23A_1062.pdf

Mike,

Please find the verification information for OB lift #KC-R7-101410-OB-23A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 10/25/2010 09:35 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/22/2010 04:42 PM
Subject: Overburden Lift #KC-R7-101410-OB-23A Verification

On 10/14/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-101410-OB-17A which was laid out in the North Overburden Lay-down area. Lift 23A was surveyed as a whole 6" lift. The lay-down area was segregated into 8 grids and was designated as a 6" lift (A-level) on 10/14/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 Nal(TL) detector. The total lift area was approximately 45' wide by 200' long. 9 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 10/15/10 at 09:00 hrs under COC #1-1062. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-048. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 4270 cpm
Gamma Count Rate Range : 3318 - 5835 cpm
Gamma Count Rate STD DEV : 414 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 10/22/10)

Sample concentration Average: 4.68 pCi/g
Sample concentration Range : 4.24 – 5.09 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

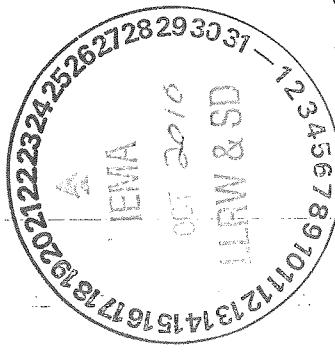
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Sample I.D.	Grid #	Sample Point	Result	Error	Ac-228			Bi-214			Pb-214			TOTAL
					Result	Error	Result	Result	Error	Result	Result	Error	Result	
104231	1-N	COMPOSITE	3.08	0.34	2.81	1.01	3.32	0.25	1.43	0.17	1.51	0.16	3.22	1.47
104232	2-N	COMPOSITE	2.92	0.33	2.69	1.00	3.17	0.24	1.30	0.16	1.39	0.16	3.06	1.34
104233	3-N	COMPOSITE	3.60	0.32	2.99	0.73	4.21	0.20	0.91	0.11	1.03	0.10	3.98	0.97
104234	4-N	COMPOSITE	2.88	0.28	3.64	0.71	4.18	0.21	1.04	0.12	1.01	0.11	3.72	1.02
104236	5-N	COMPOSITE	3.29	0.31	2.90	0.75	3.73	0.19	1.21	0.11	1.20	0.11	3.57	1.20
104237	6-N	COMPOSITE	3.40	0.36	3.38	0.95	3.60	0.25	0.94	0.14	1.02	0.14	3.53	0.98
104238	7-N	COMPOSITE	2.75	0.35	3.10	0.88	3.47	0.27	1.01	0.14	1.05	0.14	3.21	1.03
104239	8-N	COMPOSITE	3.71	0.40	3.55	0.88	4.41	0.28	0.94	0.13	0.97	0.15	4.14	0.95

**INFORMATION
ONLY**

Lift Average

4.68



OVERBURDEN PILE SAMPLING

Excavation Area: _____ Reach 7 _____

Date Sampled: _____ 10/14/2010 _____

PILE #: KC-R7-OB23 Est. Volume of Pile in Cubic Yards: _____ 130 _____

Number of Samples
Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	S_2	S_{dup}
KC-R7-OB23-A	4.68					
KC-R7-OB23-B	5.23					
KC-R7-OB23-C	4.49					
KC-R7-OB23-D	4.39					
KC-R7-OB23-E	4.45					
KC-R7-OB23-F (QC-C)	-----	5.07	0.41	0.22	0.31	0.44
Number of Samples (n)	5					

Average (Mean of the sample population) (X bar)
4.65

Average of samples is >7.2 pCi/g. Proceed with Confidence Level Check described in
SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_1)	0.31	"t" value 2.132	U_α < Release Criteria? SAMPLES TESTED MEET 95% CONFIDENCE LEVEL LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214
U _α (True Mean) = (X bar) + (t * (S ₁ /sqrt(n))) Where "t" is a statistic used for small sample tests or hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	4.94	Mean + 3 S _{dup} = Mean - 3 S _{dup} =	QC < (Mean + 3S _{dup})? QC > (Mean - 3S _{dup})? O.K. O.K.

Release Criteria
7.20

U_α < Release Criteria?

REVIEWED: SESI/ARCADIS
APPROVED: OFFSITES MANAGER:

Name/date
Michael F. Savag 10/18/2010
Name/date
K. Hall 10-18-10

Check if QC Sample Dup. is within 3 Standard Deviations (3 S _{dup}) of the mean of the sample population, per SOP 214, paragraph 11.1
3 x S _{dup} = 1.31 Mean + 3 S _{dup} = 5.96 Mean - 3 S _{dup} = 3.33 QC < (Mean + 3S _{dup})? QC > (Mean - 3S _{dup})? O.K. O.K.

Transmittal Letter

To:
 Glen Anderson, Construction Manager
 Tronox
 800 Weyrauch Street
 West Chicago, IL 60185

Copies:
 Heather VanDewalker, ARCADIS
 Marty Folan, Sevenson

ARCADIS
 800 Weyrauch Street
 West Chicago
 Illinois 60185
 Tel 630.293.7695, Ext. 11
 Fax 630.293.7719

KC 193

From:
 Michael Savage

Date:
 December 1, 2010

Subject:
 Kress Creek/West Branch Remedial Action
 Project – Reach 7

ARCADIS Project No.:
 B0071034.0000

We are sending you:
 Attached Under Separate Cover Via _____ the Following Items:
 Shop Drawings Plans Specifications Change Order
 Prints Samples Copy of Letter Reports
 Other: Reach 7 Overburden Lift Radiological Sample Results

Copies	Date	Drawing No.	Rev.	Description	Action*
		Reach 7		Reach 7 – Overburden Lift Sample Results	
1	12/1/2010	Pile # KC-R7-OB21		KC-R7-OB21-A through KC-R7-OB21-E (and one QC-B sample)	F
1	12/1/2010	Pile # KC-R7-OB24		KC-R7-OB24-A through KC-R7-OB24-E (and one QC-A sample)	F
1	12/1/2010	Pile # KC-R7-OB25		KC-R7-OB25-A through KC-R7-OB25-E (and one QC-E sample)	F
1	12/1/2010	Pile # KC-R7-OB26		KC-R7-OB26-A through KC-R7-OB26-E (and one QC-B sample)	F
1	12/1/2010	Pile # KC-R7-OB27		KC-R7-OB27-A through KC-R7-OB27-E (and one QC-D sample)	F
1	12/1/2010	Pile # KC-R7-OB28		KC-R7-OB28-A through KC-R7-OB28-E (and one QC-A sample)	F
1	12/1/2010	Pile # KC-R7-OB29		KC-R7-OB29-A through KC-R7-OB29-E (and one QC-D sample)	F
1	12/1/2010	Pile # KC-R7-OB30		KC-R7-OB30-A through KC-R7-OB30-E (and one QC-C sample)	F
1	12/1/2010	Pile # KC-R7-OB31		KC-R7-OB31-A through KC-R7-OB31-E (and one QC-C sample)	F
1	12/1/2010	Pile # KC-R7-OB32		KC-R7-OB32-A through KC-R7-OB32-E (and one QC-E sample)	F
1	12/1/2010	Pile # KC-R7-OB33		KC-R7-OB33-A through KC-R7-OB33-E (and one QC-E sample)	F



Infrastructure, environment, buildings

Copies	Date	Drawing No.	Rev.	Description	Action*
1	12/1/2010	Pile # KC-R7-OB34		KC-R7-OB34-A through KC-R7-OB34-E (and one QC-A sample)	F
1	12/1/2010	Pile # KC-R7-OB35		KC-R7-OB35-A through KC-R7-OB35-E (and one QC-B sample)	F
1	12/1/2010	Pile # KC-R7-OB36		KC-R7-OB36-A through KC-R7-OB36-E (and one QC-A sample)	F
1	12/1/2010	Pile # KC-R7-OB37		KC-R7-OB37-A through KC-R7-OB37-E (and one QC-E sample)	F
1	12/1/2010	Pile # KC-R7-OB38		KC-R7-OB38-A through KC-R7-OB38-E (and one QC-B sample)	F
1	12/1/2010	Pile # KC-R7-OB39		KC-R7-OB39-A through KC-R7-OB39-E (and one QC-E sample)	F
1	12/1/2010	Pile # KC-R7-OB40		KC-R7-OB40-A through KC-R7-OB40-E (and one QC-B sample)	F
1	12/1/2010	Pile # KC-R7-OB41		KC-R7-OB41-A through KC-R7-OB41-E (and one QC-E sample)	F
1	11/30/2010	N/A		Reach 7 Overburden Piles Tracking Spreadsheet for 2010	F

Action*

- A Approved
 AN Approved As Noted
 AS As Requested
 Other: _____

- CR Correct and Resubmit
 F File
 FA For Approval

- Resubmit _____ Copies
 Return _____ Copies
 Review and Comment

Mailing Method

- U.S. Postal Service 1st Class Courier/Hand Delivery FedEx Priority Overnight FedEx 2-Day Delivery
 Certified/Registered Mail United Parcel Service (UPS) FedEx Standard Overnight FedEx Economy
 Other: _____

Comments: _____

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Wednesday, November 03, 2010 5:50 PM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-101110-OB-21B Verification
Attachments: KC-R7-101110-OB-21B_1065.pdf

Mike,

Please find the verification information for OB lift #KC-R7-101110-OB-21B generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/03/2010 05:49 PM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 10/25/2010 03:34 PM
Subject: Overburden Lift #KC-R7-101110-OB-21B Verification

On 10/11/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-101110-OB-21B which was laid out in the East Overburden Lay-down area. Lift 21B was surveyed as a whole 12" lift. The lay-down area was segregated into 10 grids and was designated as a 12" lift (B-level) on 10/11/10. Because of the low moisture content and the nature of the material and similar material excavated it determined by Steve Shafer (VTL) that the lifts were able to be stacked into a 12" lift with the 6" lift being surveyed earlier in the day. The GPS gamma walkover surveys were performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. Each total lift area was approximately 80' wide by 120' long. 11 samples were collected with 1 of the samples being a duplicate. The samples were submitted to the WCL on 10/12/10 at 09:15 hrs under COC #1-1055. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-036. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary (Lift #21A)

Gamma Count Rate Average) : 3117 cpm
Gamma Count Rate Range : 1935 - 4838 cpm
Gamma Count Rate STD DEV : 683 cpm

Gamma Verification Survey Summary (Lift #21B)

Gamma Count Rate Average) : 2596 cpm
Gamma Count Rate Range : 2071 - 3423 cpm
Gamma Count Rate STD DEV : 272 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 10/25/10)

Sample concentration Average: 2.03 pCi/g

Sample concentration Range : 1.38 - 2.36 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

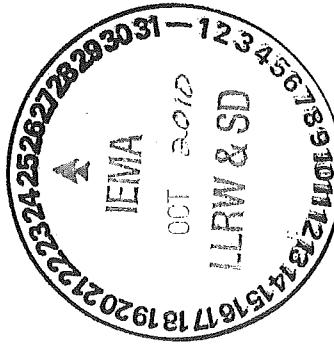
Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

Parcel Number	Grid #	Sample Point	Result	Error	Ra-228	Ra-226	TOTAL								
Sample I.D.															
104212	1-E	COMPOSITE	1.52	0.16	1.52	0.38	1.78	0.12	0.71	0.07	0.66	0.07	1.68	0.68	2.36
104213	2-E	COMPOSITE	1.24	0.14	1.38	0.40	1.38	0.10	0.53	0.06	0.47	0.06	1.33	0.50	1.83
104214	3-E	COMPOSITE	1.19	0.13	1.46	0.42	1.35	0.10	0.61	0.07	0.59	0.06	1.30	0.60	1.90
104216	4-E	COMPOSITE	1.31	0.15	1.79	0.45	1.54	0.11	0.81	0.08	0.83	0.08	1.47	0.82	2.29
104217	5-E	COMPOSITE	0.78	0.10	0.85	0.33	0.86	0.08	0.57	0.06	0.53	0.06	0.83	0.55	1.38
104218	6-E	COMPOSITE	1.35	0.14	1.61	0.53	1.66	0.12	0.66	0.07	0.73	0.07	1.54	0.69	2.23
104219	7-E	COMPOSITE	0.95	0.13	1.39	0.32	1.14	0.09	0.73	0.07	0.69	0.07	1.09	0.71	1.80
104220	8-E	COMPOSITE	1.46	0.16	1.59	0.50	1.54	0.11	0.75	0.08	0.76	0.08	1.51	0.76	2.27
104221	9-E	COMPOSITE	1.13	0.13	1.62	0.39	1.20	0.10	0.72	0.07	0.67	0.07	1.19	0.69	1.89
104222	10-E	COMPOSITE	1.56	0.16	1.64	0.47	1.77	0.12	0.62	0.07	0.63	0.07	1.69	0.62	2.32

**INFORMATION
ONLY**

Lift Average

2.03



Stephen S. [Signature]

OVERBURDEN PILE SAMPLING

Excavation Area: _____ Reach 7
 Date Sampled: _____ 10/11/2010

PILE #: KC-R7-OB21 Est. Volume of Pile in Cubic Yards: _____ 340

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	S_2	S_{dup}
KC-R7-OB21-A	2.26					
KC-R7-OB21-B	1.86					
KC-R7-OB21-C	1.78					
KC-R7-OB21-D	2.24					
KC-R7-OB21-E	2.26					
KC-R7-OB21-F (QC-B)	-----	1.83	0.20	0.14	0.17	
Number of Samples (n)	5					
Average (Mean of the sample population) (X bar)	2.08					

$U_\alpha < \text{Release Criteria?}$

5

2.08

7.20

Standard Deviation of sample population (S_1)	0.21	$t_{\alpha/2}^{\text{df}}$ value 2.28	U_α (True Mean) = $(X \text{ bar}) + (t * (S_1 / \sqrt{n}))$ Where $t_{\alpha/2}^{\text{df}}$ is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ONSITE BACKFILL PER SOP-214
Release Criteria	7.20			

Check if QC Sample Dup. is within 3 Standard Deviations (3 S_{dup}) of the mean of the sample population, per SOP 214, paragraph 11.1
3 $\times S_{dup}$ = 0.82 Mean + 3 S_{dup} = 2.90 Mean - 3 S_{dup} = 1.26 QC < (Mean + 3 S_{dup})? O.K. QC > (Mean - 3 S_{dup})? O.K.

REVIEWED: SES/ARCADIS

Michael F. Savag 10/13/2010

APPROVED: OFFSITES MANAGER:

John Aho 10-13-10

Name/date

File #: STP 6.2

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 16, 2010 10:37 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-102910-OB-24A Verification (Correction)
Attachments: KC-R7-112910-OB-24A_1067.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Mike,

Please find the verification information for OB lift #KC-R7-102910-OB-24A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/16/2010 10:36 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/05/2010 01:54 PM
Subject: FW: Overburden Lift #KC-R7-102910-OB-24A Verification (Correction)

From: Shafer, Steve
Sent: Friday, November 05, 2010 1:51 PM
To: Runyon, Tim; 'Fischer.Timothy@epamail.epa.gov'
Subject: Overburden Lift #KC-R7-102910-OB-24A Verification (Correction)

On 10/29/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-102910-OB-24A which was laid out in the East Overburden Lay-down area. Lift 24A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 10/29/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that another lift could not be laid out over this 6" lift. The GPS gamma walkover surveys were performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 Nal(TL) detector. The lift area was approximately 80' wide by 120' long. 11 samples were collected with 1 of the samples being a duplicate. The samples were submitted to the WCL on 10/29/10 at 18:00 hrs under COC #1-1067. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-050. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary (Lift #24A)

Gamma Count Rate Average : 3830 cpm
Gamma Count Rate Range : 2828 - 5863 cpm
Gamma Count Rate STD DEV : 705 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/5/10)

Sample concentration Average: 3.63 pCi/g

Sample concentration Range : 2.65 – 4.58 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

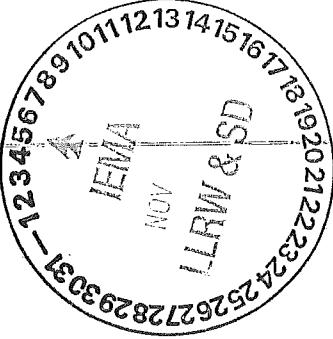
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Parcel Number:	Grid #	Sample Point	Tl-208			Bi-212			Ac-228			Bi-214			Pb-214			Ra-226			TOTAL		
			Result	Error	Result	Result	Result	Error	Result	Error	Result	Error											
104243	1-E	COMPOSITE	2.52	0.26	2.88	0.61	2.85	0.19	1.23	0.12	1.05	0.11	2.74	1.14	3.88								
104244	2-E	COMPOSITE	2.37	0.25	2.05	0.66	2.73	0.17	0.88	0.10	0.89	0.10	2.59	0.89	3.47								
104246	3-E	COMPOSITE	2.53	0.25	2.81	0.62	2.94	0.16	1.18	0.11	1.06	0.10	2.82	1.12	3.93								
104247	4-E	COMPOSITE	3.23	0.29	3.27	0.61	3.44	0.19	1.24	0.11	1.17	0.11	3.37	1.21	4.58								
104248	5-E	COMPOSITE	1.84	0.20	1.73	0.44	2.42	0.15	0.99	0.10	0.89	0.09	2.17	0.94	3.11								
104249	6-E	COMPOSITE	2.53	0.25	2.61	0.58	2.91	0.17	0.92	0.10	0.91	0.09	2.78	0.92	3.70								
104250	7-E	COMPOSITE	2.15	0.22	2.33	0.52	2.59	0.15	0.91	0.09	0.84	0.09	2.44	0.87	3.31								
104251	8-E	COMPOSITE	2.28	0.26	2.75	0.58	2.49	0.16	1.75	0.13	1.44	0.13	2.44	1.59	4.03								
104252	9-E	COMPOSITE	2.54	0.25	2.80	0.61	2.66	0.16	0.98	0.10	0.94	0.09	2.64	0.95	3.59								
104253	10-E	COMPOSITE	1.62	0.19	1.60	0.54	1.72	0.13	1.03	0.10	0.91	0.09	1.69	0.96	2.65								

INFORMATION
ONLY

Lift Average

3.63



Stephen Blodgett

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 10/29/2010

PILE #: KC-R7-OB24 Est. Volume of Pile in Cubic Yards: 170

Number of Samples
Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	S ₂	S _{dup}
KC-R7-OB24-A	3.98				
KC-R7-OB24-B	4.57				
KC-R7-OB24-C	3.52				
KC-R7-OB24-D	2.99				
KC-R7-OB24-E	2.58				
KC-R7-OB24-F (QC-A)			2.82	0.28	0.22
Number of Samples (n)	<u>5</u>				
Average (Mean of the sample population) (X bar)	<u>3.53</u>				

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in
SOP-214, Paragraph 6.12

Standard Deviation of sample population (S ₁)	0.70	t" value 2.132	3 x S ₁ = 2.21
U_{α} (True Mean) = (X bar) + (t * (S ₁ /sqrt(n))) Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	4.20	QC < (Mean + 3S ₁)? 5.73 1.32	O.K.
Release Criteria	7.20	QC > (Mean - 3S ₁)? O.K.	O.K.
SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214			

REVIEWED: SES/ARCADIS
APPROVED: OFFSITES MANAGER:

Dodd 11-1-10 / Michael F. Savage 11/03/2010

Name/date
John 11-3-10

Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 16, 2010 10:40 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-102910-OB-25A Verification (correction)
Attachments: KC-R7-102910-OB-25A_1068.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Mike,

Please find the verification information for OB lift #KC-R7-102910-OB-25A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/16/2010 10:39 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/15/2010 01:25 PM
Subject: Overburden Lift #KC-R7-102910-OB-25A Verification (correction)

On 10/29/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-102910-OB-25A which was laid out in the West Overburden Lay-down area. Lift 25A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 10/29/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 60' wide by 120' long. 8 composite samples were collected with one of those samples being a duplicate. The samples were submitted to the WCL on 10/29/10 at 18:00 hrs under COC #1-1068. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-050. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 4130 cpm
Gamma Count Rate Range : 3104 - 6111 cpm
Gamma Count Rate STD DEV : 530 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/5/10)

Sample concentration Average: 4.29 pCi/g
Sample concentration Range : 3.73 – 5.08 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

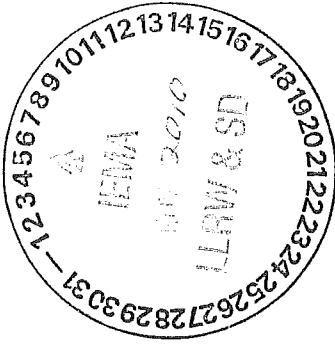
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Parcel Number:	Grid #	Sample Point	Result	Error	Tl-208			Bi-212			Ac-228			Bi-214			Pb-214			TOTAL		
					Result	Error	Result	Result	Error	Result	Result	Error	Result	Error	Result	Error	Result	Error	Result	Result		
104254	1-W	COMPOSITE	3.08	0.29	3.61	0.67	4.51	0.21	1.12	0.11	1.06	0.11	3.99	0.09	5.08	0.09	4.38	0.79	4.38			
104256	2-W	COMPOSITE	2.82	0.28	2.48	0.70	4.06	0.20	0.78	0.09	0.80	0.09	3.59	0.79	3.72	0.79	2.93	0.09	3.72			
104257	3-W	COMPOSITE	2.27	0.24	3.05	0.64	3.22	0.17	0.86	0.10	0.74	0.09	3.14	0.79	3.93	0.09	3.14	0.79	3.93			
104258	4-W	COMPOSITE	2.71	0.26	2.13	0.59	3.45	0.18	0.76	0.10	0.82	0.09	2.96	0.08	3.73	0.08	2.96	0.77	3.73			
104259	5-W	COMPOSITE	2.20	0.23	2.63	0.59	3.38	0.17	0.79	0.09	0.76	0.09	3.73	0.93	4.66	0.10	3.73	0.93	4.66			
104260	6-W	COMPOSITE	3.30	0.31	3.28	0.69	3.94	0.20	0.92	0.10	0.94	0.10	3.56	0.98	4.54	0.10	3.56	0.98	4.54			
104261	7-W	COMPOSITE	3.21	0.29	3.84	0.66	3.68	0.18	0.99	0.10	0.96	0.10	3.56	0.98	4.54	0.10	3.56	0.98	4.54			

**INFORMATION
ONLY**

Lift Average

4.29



Stephanie Blodger

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 10/29/2010

PILE #: KC-R7-OB25

Est. Volume of Pile in Cubic Yards: 188

Number of Samples
Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	S_2	S_{dup}
KC-R7-OB25-A	3.78					
KC-R7-OB25-B	4.58					
KC-R7-OB25-C	4.94					
KC-R7-OB25-D	4.99					
KC-R7-OB25-E	5.65					
KC-R7-OB25-F (QC-E)	-----	4.96	0.38	0.25	0.31	
Number of Samples (n)	<u>5</u>					
Average (Mean of the sample population) (\bar{X} bar)	<u>4.79</u>					
Average of samples is <7.2 pCi/g, Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12						
Standard Deviation of sample population (S_x)	0.61	$t_{\alpha/2}$ value 2.132			2.06	
U _α (True Mean) = (\bar{X} bar) + ($t_{\alpha/2} * (S_x / \sqrt{n})$) Where " $t_{\alpha/2}$ " is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	5.37	QC < (Mean + 3 S_{dup})? QC > (Mean - 3 S_{dup})?		Mean + 3 S_{dup} = 6.84 Mean - 3 S_{dup} = 2.73	O.K. O.K.	
Release Criteria	7.20	SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214				
U _α < Release Criteria?		<i>Dale M. Johnson</i> / Michael F. Savage 11/03/2010				
REVIEWED: SES/ARCADIS		<i>John Dohm</i> 11-3-10				
APPROVED: OFFSITES MANAGER:		Name/date				
		Name/date				

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Friday, November 19, 2010 11:21 AM
To: Savage, Michael
Cc: glen.anderson@trono.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-103010-OB-26A Verification (Correction)
Attachments: KC-R7-103010-OB-26A_1069.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Mike,

Please find a correction to the verification information for OB lift #KC-R7-103010-OB-26A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/19/2010 11:20 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/19/2010 10:27 AM
Subject: FW: Overburden Lift #KC-R7-103010-OB-26A Verification (Correction)

I forgot the attachment to this correction. Please save this as final

From: Shafer, Steve
Sent: Friday, November 19, 2010 10:26 AM
To: Runyon, Tim; 'Fischer.Timothy@epamail.epa.gov'
Subject: Overburden Lift #KC-R7-103010-OB-26A Verification (Correction)

On 10/30/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-103010-OB-26A which was laid out in the North Overburden Lay-down area. Lift 26A was surveyed as a whole 6" lift. The lay-down area was segregated into 8 grids and was designated as a 6" lift (A-level) on 10/30/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 45' wide by 200' long. 9 composite samples were collected which included 1 duplicate. The samples were submitted to the WCL on 10/30/10 at 13:00 hrs under COC #1-1069. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-051. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 4412 cpm
Gamma Count Rate Range : 3190 - 5955 cpm
Gamma Count Rate STD DEV : 401 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/10/10)

Sample concentration Average: 5.73 pCi/g

Sample concentration Range : 5.08 – 6.28 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

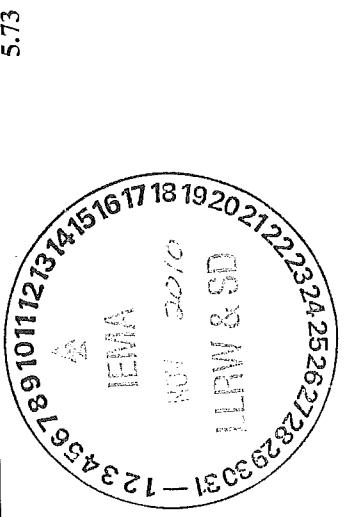
Stephen B. Shafer
Senior Health Physicist
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(630) 632-5819 Cell

Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

Parcel Number:	Grid #	Sample Point	Result	Error	Bi-212	Ac-228	Bi-214	Pb-214	Ra-228	Ra-226	TOTAL
104262	1-N	COMPOSITE	4.05	0.34	4.27	0.80	4.61	0.23	1.52	0.13	4.43
104263	2-N	COMPOSITE	3.68	0.33	3.69	0.65	4.13	0.20	1.26	0.12	3.99
104264	3-N	COMPOSITE	4.48	0.38	4.75	0.77	4.95	0.22	1.51	0.14	4.83
104266	4-N	COMPOSITE	3.72	0.33	3.91	0.73	4.78	0.23	2.03	0.15	5.58
104267	5-N	COMPOSITE	3.01	0.28	3.20	0.74	4.22	0.21	1.47	0.13	4.00
104268	6-N	COMPOSITE	3.32	0.31	3.30	0.64	4.37	0.21	1.15	0.11	4.00
104269	7-N	COMPOSITE	4.02	0.37	4.22	0.80	4.82	0.22	1.74	0.15	4.58
104270	8-N	COMPOSITE	3.88	0.34	3.82	0.69	4.76	0.23	1.57	0.13	4.44

INFORMATION
ONLY

Lift Average



5.73

Stephanie B. Strohbehn

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 10/29/2010

PILE #: KC-R7-OB26 Est. Volume of Pile in Cubic Yards: 130

Number of Samples
Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB26-A	6.11					
KC-R7-OB26-B	5.04					
KC-R7-OB26-C	4.97					
KC-R7-OB26-D	6.02					
KC-R7-OB26-E	5.04					
KC-R7-OB26-F (QC-B)						
Number of Samples (n)	<u>5</u>					
Average (Mean of the sample population) (X bar)	<u>5.44</u>					
Standard Deviation of sample population (S_x)						
U_α (True Mean) = $(X \text{ bar}) + (t * (S_x / \sqrt{n}))$ Where t^* is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	<u>5.92</u>	t^* value <u>2.132</u>				
Release Criteria					<u>7.20</u>	

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ONSITE BACKFILL PER SOP-214	
$U_\alpha < \text{Release Criteria?}$	<u>U_a < 7.20</u>
$\text{Mean} + 3 S_{dup}$	<u>7.24</u>
$\text{Mean} - 3 S_{dup}$	<u>3.63</u>
$QC < (\text{Mean} + 3 S_{dup})?$	<u>O.K.</u>
$QC > (\text{Mean} - 3 S_{dup})?$	<u>O.K.</u>

REVIEWED: SES/ARCADIS

APPROVED: OFFSITES MANAGER:

Michael F. Salazar / 11-1-10

Name/date

Michael F. Salazar / 11-3-10

Name/date

Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 16, 2010 10:41 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110110-OB-27A Verification (Correction)
Attachments: KC-R7-110110-OB-27A_1071.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Mike,

Please find the verification information for OB lift #KC-R7-110110-OB-27A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/16/2010 10:40 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/15/2010 02:21 PM
Subject: Overburden Lift #KC-R7-110110-OB-27A Verification (Correction)

On 11/01/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110110-OB-27A which was laid out in the East Overburden Lay-down area. Lift 27A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 11/01/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that another lift could not be laid out over this 6" lift. The GPS gamma walkover surveys were performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The lift area was approximately 80' wide by 120' long. 11 samples were collected with 1 of the samples being a duplicate. The samples were submitted to the WCL on 11/02/10 at 10:00 hrs under COC #1-1071. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-052. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary (Lift #27A)

Gamma Count Rate Average : 3970 cpm
Gamma Count Rate Range : 2206 - 5569 cpm
Gamma Count Rate STD DEV : 540 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/12/10)

Sample concentration Average: 4.61 pCi/g
Sample concentration Range : 3.01 – 5.45 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

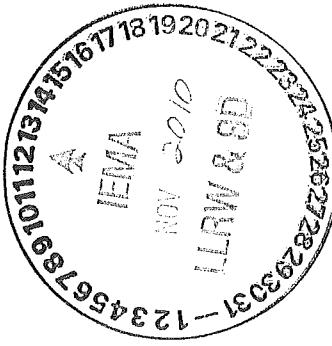
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Parcel Number:	Grid #	Sample Point	Lift #KC-R7-110110-OB-27A (East Area): OOC# 1-1071, November 1, 2010						Lift #KC-R7-110110-OB-27A (East Area): OOC# 1-1071, November 1, 2010						Lift #KC-R7-110110-OB-27A (East Area): OOC# 1-1071, November 1, 2010					
			Tl-208		Bi-212		Ac-228		Bi-214		Pb-214		Ra-228		Ra-226		TOTAL			
Sample I.D.			Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Total			
104273	1-E	COMPOSITE	2.96	0.28	2.97	0.64	3.45	0.18	0.96	0.10	0.89	0.09	0.09	0.09	3.29	0.92	4.21			
104274	2-E	COMPOSITE	3.75	0.34	4.02	0.75	4.58	0.22	1.16	0.12	1.12	0.11	0.11	0.11	4.31	1.14	5.45			
104276	3-E	COMPOSITE	3.67	0.32	3.82	0.69	4.06	0.20	0.97	0.10	0.99	0.10	0.10	0.10	3.95	0.98	4.92			
104277	4-E	COMPOSITE	3.68	0.33	3.80	0.81	4.30	0.21	1.15	0.11	1.28	0.12	0.12	0.10	4.10	1.21	5.31			
104278	5-E	COMPOSITE	3.11	0.29	3.34	0.68	4.08	0.20	1.05	0.10	1.06	0.10	0.10	0.10	3.75	1.06	4.81			
104279	6-E	COMPOSITE	2.41	0.24	2.88	0.54	3.37	0.18	1.53	0.12	1.65	0.13	0.13	0.13	3.02	1.59	4.61			
104280	7-E	COMPOSITE	3.68	0.32	3.73	0.76	4.74	0.21	0.93	0.10	0.93	0.10	0.10	0.10	4.38	0.93	5.31			
104281	8-E	COMPOSITE	2.61	0.28	3.70	0.71	3.09	0.19	1.11	0.11	0.99	0.10	0.10	0.10	2.98	1.05	4.03			
104282	9-E	COMPOSITE	3.11	0.28	3.54	0.71	4.10	0.19	0.67	0.08	0.74	0.08	0.08	0.08	3.77	0.71	4.48			
104283	10-E	COMPOSITE	2.17	0.22	2.14	0.51	2.45	0.15	0.69	0.09	0.64	0.08	0.08	0.08	2.35	0.66	3.01			

**INFORMATION
ONLY**

Lift Average

4.61



Stephen Blaha

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 11/1/2010

PILE #: KC-R7-OB27 Est. Volume of Pile in Cubic Yards: 170

Number of Samples
Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	S_2	S_{dup}
KC-R7-OB27-A	3.87					
KC-R7-OB27-B	4.62					
KC-R7-OB27-C	4.76					
KC-R7-OB27-D	3.85					
KC-R7-OB27-E	4.06					
KC-R7-OB27-F (QC-D)	-----	4.29	0.35	0.20	0.27	
Number of Samples (n)	5					
Average (Mean of the sample population) (X bar)	4.23					

$U_a < \text{Release Criteria?}$

5

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12

Check if QC Sample Dup. is within 3 Standard Deviations ($3 S_{dup}$) of the mean of the sample population, per SOP 214, paragraph 11.1

Standard Deviation of sample population (S_1)	0.38	t " value 2.132	$3 \times S_{dup} =$ 1.41
U_a (True Mean) = $(X \text{ bar}) + (t * (S_1 / \sqrt{n}))$ Where " t " is a statistic used for small sample tests or hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	4.60	Mean + $3 S_{dup}$ = 5.64 Mean - $3 S_{dup}$ = 2.82	QC < (Mean + $3 S_{dup}$)? QC > (Mean - $3 S_{dup}$)? O.K. O.K.
Release Criteria	7.20		

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
AS ON SITE BACKFILL PER SOP-214

REVIEWED: SES/ARCADIS

Name/date

APPROVED: OFFSITES MANAGER:

Name/date

John Johnson 11-5-10

John Johnson 11-5-10

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 16, 2010 10:41 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110210-OB-28A Verification
Attachments: KC-R7-110210-OB-28A_1072.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Mike,

Please find the verification information for OB lift #KC-R7-110210-OB-28A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/16/2010 10:40 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/15/2010 02:37 PM
Subject: Overburden Lift #KC-R7-110210-OB-28A Verification

On 11/02/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110210-OB-28A which was laid out in the West Overburden Lay-down area. Lift 28A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 11/02/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 Nal(TL) detector. The total lift area was approximately 60' wide by 120' long. 8 composite samples were collected with one of those samples being a duplicate. The samples were submitted to the WCL on 11/02/10 at 13:00 hrs under COC #1-1072. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-053. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 3977 cpm
Gamma Count Rate Range : 2785 - 5165 cpm
Gamma Count Rate STD DEV : 505 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/8/10)

Sample concentration Average: 3.44 pCi/g
Sample concentration Range : 2.21 – 4.38 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
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(630) 632-5819 Cell

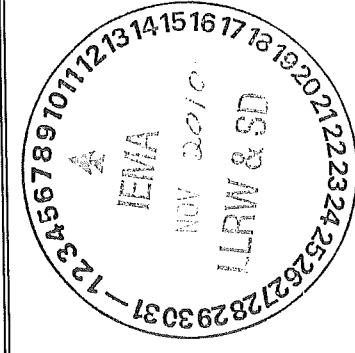
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Sample I.D.	Grid #	Sample Point	Result	Error	Bi-208			Ac-228			Bi-214			Pb-214			Ra-228			Ra-226			TOTAL		
					Result	Error	Result	Result	Error	Result	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	
104284	1-W	COMPOSITE	2.38	0.23	2.40	0.56	2.56	0.15	0.48	0.07	0.49	0.07	0.49	0.07	0.48	0.07	2.50	0.48	2.98	0.44	0.44	2.21	0.44	2.21	
104286	2-W	COMPOSITE	1.63	0.17	1.44	0.48	1.87	0.12	0.44	0.06	0.44	0.07	1.77	0.07	0.44	0.07	1.77	0.07	2.67	0.47	3.15	0.47	3.15	0.47	3.15
104287	3-W	COMPOSITE	2.44	0.23	2.62	0.63	2.78	0.15	0.45	0.08	0.49	0.07	0.49	0.07	0.49	0.07	3.49	0.57	4.06	0.57	4.06	0.57	4.06	0.57	4.06
104288	4-W	COMPOSITE	3.34	0.29	3.19	0.69	3.58	0.19	0.61	0.09	0.54	0.09	0.54	0.09	0.54	0.09	3.55	0.72	4.27	0.72	4.27	0.72	4.27	0.72	4.27
104289	5-W	COMPOSITE	3.15	0.29	3.59	0.62	3.71	0.19	0.74	0.09	0.70	0.10	0.70	0.10	0.70	0.10	3.55	0.72	4.27	0.72	4.27	0.72	4.27	0.72	4.27
104290	6-W	COMPOSITE	2.26	0.21	2.59	0.53	2.71	0.15	0.49	0.08	0.49	0.07	0.49	0.07	0.49	0.07	2.56	0.49	3.05	0.49	3.05	0.49	3.05	0.49	3.05
104291	7-W	COMPOSITE	3.36	0.31	4.21	0.75	3.82	0.20	0.69	0.10	0.67	0.09	0.67	0.09	0.67	0.09	3.71	0.68	4.38	0.68	4.38	0.68	4.38	0.68	4.38

**INFORMATION
ONLY**

Lift Average

3.44



1072.xls

Page 1

Alphonse B. Blythe

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 11/2/2010
 PILE #: KC-R7-OB28
 Est. Volume of Pile in Cubic Yards: 188

Number of Samples Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB28-A	4.57					
KC-R7-OB28-B	4.95					
KC-R7-OB28-C	3.65					
KC-R7-OB28-D	3.26					
KC-R7-OB28-E	3.89					
KC-R7-OB28-F (QC-A)			4.25	0.39	0.19	0.29
Number of Samples (n)						
Average (Mean of the sample population) (X_{bar})	5					
Average (Mean of the sample population) (X_{bar})	4.06					

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12

Check if QC Sample Dup. is within 3 Standard Deviations ($3 S_{dup}$) of the mean of the sample population, per SOP 214, paragraph 11.1	
$3 \times S_{dup} =$	2.04

Standard Deviation of sample population (S_1)	0.61	$t_{\alpha/2}^{(n-1)}$ value 2.132	$QC < (Mean + 3S_{dup})?$ 6.10	O.K.
$U_{\alpha} (\text{True Mean}) = (X_{bar}) + (t_{\alpha/2}^{(n-1)} / S_1)$ Where $t_{\alpha/2}^{(n-1)}$ is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	4.65		$QC > (Mean - 3S_{dup})?$ 2.03	O.K.
Release Criteria	7.20			

**SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
AS ON SITE BACKFILL PER SOP-214**

$U_{\alpha} < \text{Release Criteria?}$

REVIEWED: SES/ARCADIS
John D. Johnson 11-5-10
 APPROVED: OFFSITES MANAGER:
John D. Johnson 11-5-10
 Name/date
 Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 16, 2010 10:42 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110210-OB-29A Verification
Attachments: KC-R7-110210-OB-29A_1073.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Mike,

Please find the verification information for OB lift #KC-R7-110210-OB-29A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/16/2010 10:41 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/15/2010 02:42 PM
Subject: Overburden Lift #KC-R7-110210-OB-29A Verification

On 11/0210, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110210-OB-29A which was laid out in the North Overburden Lay-down area. Lift 29A was surveyed as a whole 6" lift. The lay-down area was segregated into 8 grids and was designated as a 6" lift (A-level) on 11/0210. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 Nal(TL) detector. The total lift area was approximately 45' wide by 200' long. 9 samples were collected which included 1 duplicate. The samples were submitted to the WCL on 11/02/10 at 17:00 hrs under COC #1-1073. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-053. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 4269 cpm
Gamma Count Rate Range : 2894 - 6410 cpm
Gamma Count Rate STD DEV : 667 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/12/10)

Sample concentration Average: 4.89 pCi/g
Sample concentration Range : 3.36 – 5.95 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

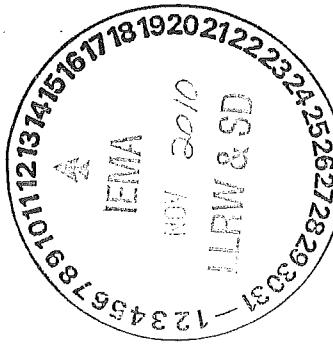
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Parcel Number:	Grid #	Sample Point	TI-208			Bi-212			Ac-228			Bi-214			Pb-214			Ra-228			Ra-226		
			Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error									
104292	1-N	COMPOSITE	2.36	0.24	2.19	0.59	2.92	0.17	0.65	0.10	0.65	0.09	0.09	2.71	0.65	3.36	0.36	0.65	0.09	2.71	0.65	3.36	0.36
104293	2-N	COMPOSITE	2.73	0.25	2.55	0.60	3.08	0.17	0.77	0.10	0.78	0.08	0.08	2.95	0.78	3.73	0.73	0.78	0.08	2.95	0.78	3.73	0.73
104294	3-N	COMPOSITE	3.21	0.30	3.07	0.62	3.82	0.19	0.87	0.10	0.85	0.10	0.10	3.60	0.86	4.46	0.46	0.86	0.10	3.60	0.86	4.46	0.46
104296	4-N	COMPOSITE	4.22	0.37	4.14	0.78	4.82	0.22	0.96	0.12	1.00	0.11	0.11	4.63	0.98	5.61	0.61	0.98	0.11	4.63	0.98	5.61	0.61
104297	5-N	COMPOSITE	3.77	0.36	4.42	0.83	4.47	0.22	1.00	0.12	0.96	0.11	0.11	4.29	0.98	5.27	0.27	0.98	0.11	4.29	0.98	5.27	0.27
104298	6-N	COMPOSITE	3.68	0.33	4.32	0.79	4.24	0.21	1.05	0.11	0.96	0.10	0.10	4.09	1.00	5.09	0.09	1.00	0.10	4.09	1.00	5.09	0.09
104299	7-N	COMPOSITE	4.40	0.44	3.68	1.25	5.20	0.30	1.13	0.16	1.02	0.14	0.14	4.89	1.06	5.95	0.95	1.06	0.14	4.89	1.06	5.95	0.95
104300	8-N	COMPOSITE	4.09	0.41	4.72	1.06	4.90	0.29	1.03	0.15	1.00	0.15	0.15	4.64	1.01	5.65	0.65	1.01	0.15	4.64	1.01	5.65	0.65

INFORMATION
ONLY

Lift Average

4.89



OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 11/22/2010

PILE #: KC-R7-OB29 Est. Volume of Pile in Cubic Yards: 130

Number of Samples
Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	Std. Dev. for the analyses of the duplicate sample	S_{dup}
KC-R7-OB29-A	4.96				
KC-R7-OB29-B	4.48				
KC-R7-OB29-C	4.48				
KC-R7-OB29-D	4.19				
KC-R7-OB29-E	4.13				
KC-R7-OB29-F (QC-D)			4.16	0.37	0.27

Number of Samples (n)

5

Average (Mean of the sample population) (\bar{X} bar)
4.45

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in
SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_1)
0.30

t'' value
2.132

U_α (True Mean) = $(\bar{X} \text{ bar}) + (t'' * (S_1 / \sqrt{n}))$
Where "t''" is a statistic used for small sample tests
of hypotheses (the Student Distribution), from
SOP No. KMS-102, Attachment 10.6

Release Criteria
7.20

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
AS ON SITE BACKFILL PER SOP-214

REVIEWED: SES/ARCADIS

D. H. Johnson 11-4-10

APPROVED: OFFSITES MANAGER:

M. Johnson 11-5-10

Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 16, 2010 10:43 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110310-OB-30A Verification
Attachments: KC-R7-110310-OB-30A_1074.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Mike,

Please find the verification information for OB lift #KC-R7-110310-OB-30A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/16/2010 10:42 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/15/2010 02:56 PM
Subject: Overburden Lift #KC-R7-110310-OB-30A Verification

On 11/03/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110310-OB-30A which was laid out in the West Overburden Lay-down area. Lift 30A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 11/03/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 60' wide by 120' long. 8 composite samples were collected with one of those samples being a duplicate. The samples were submitted to the WCL on 11/03/10 at 13:40 hrs under COC #1-1074. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-054. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. However, one sample in Grid #6-W did exceed the 7.2 pCi/g project cleanup criteria by 0.06 pCi/g but the grid average was well below the project cleanup objective. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 4590 cpm
Gamma Count Rate Range : 3429 - 6203 cpm
Gamma Count Rate STD DEV : 684 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/12/10)

Sample concentration Average: 4.99 pCi/g
Sample concentration Range : 2.01 – 7.26 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM, LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
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(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

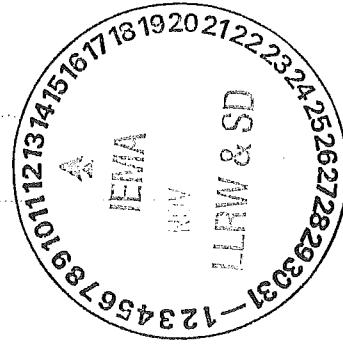
Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

Parcel Number:	Grid #	Sample Point	Ti-208			Bi-212			Ac-228			Bi-214			Pb-214			Ra-228			Ra-226		
			Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error									
104301	1-W	COMPOSITE	3.32	0.36	2.64	1.02	4.51	0.28	0.76	0.15	0.94	0.13	4.00	0.86	4.86								
104302	2-W	COMPOSITE	3.69	0.40	3.44	1.01	5.14	0.31	0.97	0.16	0.85	0.14	4.54	0.90	5.45								
104303	3-W	COMPOSITE	4.98	0.48	5.06	1.28	6.53	0.33	0.96	0.16	0.92	0.15	5.98	0.94	6.92								
104304	4-W	COMPOSITE	4.25	0.44	4.35	1.15	4.86	0.28	0.94	0.15	1.04	0.14	4.66	0.99	5.65								
104306	5-W	COMPOSITE	1.86	0.24	2.16	0.74	2.22	0.19	0.73	0.11	0.72	0.11	2.09	0.73	2.81								
104307	6-W	COMPOSITE	5.64	0.54	5.24	1.17	6.58	0.35	1.08	0.15	0.97	0.14	6.24	1.02	7.26								
104308	7-W	COMPOSITE	1.46	0.21	1.85	0.62	1.67	0.17	0.42	0.08	0.40	0.09	1.60	0.41	2.01								

INFORMATION
ONLY

Lift Average

4.99



Stephen B. Johnson

OVERBURDEN PILE SAMPLING

Excavation Area: _____ Reach 7
 Date Sampled: _____ 11/3/2010

PILE # : KC-R7-OB30 Est. Volume of Pile in Cubic Yards: _____ 188

Number of Samples Required Per SOP 214:
 5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB30-A	3.56					
KC-R7-OB30-B	3.57					
KC-R7-OB30-C	4.14					
KC-R7-OB30-D	4.72					
KC-R7-OB30-E	4.56					
KC-R7-OB30-F (QC-C)			4.55	0.39	0.20	0.29
Number of Samples (n)						
Average (Mean of the sample population) (X bar)						

5
 4.11

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12

Check if QC Sample Dup. is within 3 Standard Deviations ($3 S_{dup}$) of the mean of the sample population, per SOP 214, paragraph 11.1	
$3 \times S_{dup} =$	1.70

Mean + 3 S_{dup} =
 Mean - 3 S_{dup} =

QC < (Mean + 3 S_{dup})?
 QC > (Mean - 3 S_{dup})?

O.K.
 O.K.

Check if QC Sample Dup. is within 3 Standard Deviations ($3 S_{dup}$) of the mean of the sample population, per SOP 214, paragraph 11.1	
$3 \times S_{dup} =$	1.70

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ONSITE BACKFILL PER SOP-214	
U _a < Release Criteria? Release Criteria	7.20

REVIEWED: SES/ARCADIS
 APPROVED: OFFSITES MANAGER:




 Name/date

Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Friday, November 19, 2010 11:19 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110410-OB-31A Verification
Attachments: KC-R7-110410-OB-31A_1075.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Mike,

Please find the verification information for OB lift #KC-R7-110410-OB-31A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/19/2010 11:18 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/17/2010 01:12 PM
Subject: Overburden Lift #KC-R7-110410-OB-31A Verification

On 11/04/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110410-OB-31A which was laid out in the East Overburden Lay-down area. Lift 31A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 11/04/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that another lift could not be laid out over this 6" lift. The GPS gamma walkover surveys were performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(Tl) detector. The lift area was approximately 80' wide by 120' long. 11 samples were collected with 1 of the samples being a duplicate. The samples were submitted to the WCL on 11/04/10 at 15:00 hrs under COC #1-1075. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-055.

During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary (Lift #31A)

Gamma Count Rate Average : 4088 cpm
Gamma Count Rate Range : 3182 - 5410 cpm
Gamma Count Rate STD DEV : 366 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/17/10)

Sample concentration Average: 4.97 pCi/g
Sample concentration Range : 3.88 – 5.74 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM, LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

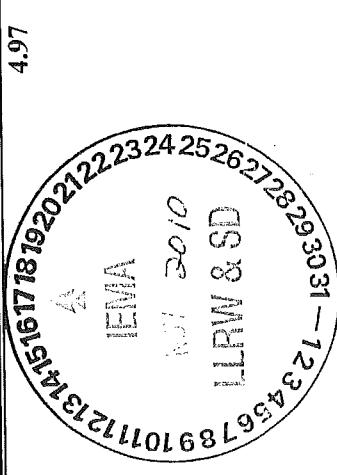
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Sample I.D.	Grid #	Sample Point	Result	Error	TL-208		Bi-212		Ac-228		Bi-214		Pb-214		Ra-228		Ra-226		TOTAL	
					Result	Error														
104309	1-E	COMPOSITE	3.59	0.36	3.81	0.92	4.27	0.26	1.08	0.14	0.99	0.12	4.02	1.03	5.05	5.74				
104310	2-E	COMPOSITE	3.91	0.40	4.68	0.97	4.60	0.28	1.32	0.16	1.38	0.16	4.39	1.35						
104311	3-E	COMPOSITE	3.17	0.34	2.98	0.92	3.43	0.23	0.52	0.11	0.59	0.11	3.33	0.55						
104312	4-E	COMPOSITE	3.50	0.37	3.75	0.89	4.05	0.25	1.02	0.13	1.03	0.14	3.86	1.03						
104313	5-E	COMPOSITE	3.91	0.40	3.94	0.91	4.31	0.26	0.90	0.13	0.85	0.13	4.17	0.88						
104314	6-E	COMPOSITE	3.46	0.36	3.47	0.97	3.84	0.24	0.71	0.12	0.67	0.12	3.72	0.69						
104316	7-E	COMPOSITE	3.59	0.37	3.38	0.78	4.33	0.26	0.84	0.12	0.71	0.11	4.03	0.77						
104317	8-E	COMPOSITE	3.80	0.38	4.82	1.05	4.49	0.27	0.91	0.14	0.88	0.12	4.28	0.89						
104318	9-E	COMPOSITE	3.86	0.34	3.86	0.70	4.21	0.20	1.37	0.12	1.32	0.11	4.10	1.34						
104319	10-E	COMPOSITE	3.72	0.32	3.63	0.68	3.99	0.20	1.28	0.12	1.34	0.12	3.90	1.31						

INFORMATION
ONLY

Lift Average

4.97



Stephanie B. Schaffer

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 11/3/2010

PILE #: KC-R7-OB31 Est. Volume of Pile in Cubic Yards: 170

Number of Samples
Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB31-A	4.07					
KC-R7-OB31-B	4.11					
KC-R7-OB31-C	3.94					
KC-R7-OB31-D	3.96					
KC-R7-OB31-E	4.63					
KC-R7-OB31-F (QC-C)			4.54	0.39	0.17	0.28
Number of Samples (n)	5					
Average (Mean of the sample population) (\bar{X} bar)	4.14					

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_1)	0.25	$t_{\alpha/2}^{(n)}$ value 2.132	$3 \times S_{dup} =$ 1.12
U_{α} (True Mean) = $(\bar{X} \text{ bar}) + (t * (S_1 / \sqrt{n}))$ Where $t_{\alpha/2}^{(n)}$ is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	4.38		Mean + $3 S_{dup} =$ 5.27 Mean - $3 S_{dup} =$ 3.02
Release Criteria	7.20		QC < (Mean + $3 S_{dup}$)? QC > (Mean - $3 S_{dup}$)? O.K. O.K.

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
AS ONSITE BACKFILL PER SOP-214

Michael Santos Name/date
11/6/10
John Johnson Name/date
11/8/10

REVIEWED: SES/ARCADIS
APPROVED: OFFSITES MANAGER:

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 30, 2010 11:43 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110410-OB-32A Verification
Attachments: KC-R7-110410-OB-32A_1076.pdf

Mike,

Please find the verification information for OB lift #KC-R7-110410-OB-32A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/30/2010 11:42 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/19/2010 02:19 PM
Subject: Overburden Lift #KC-R7-110410-OB-32A Verification

On 11/04/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110410-OB-32A which was laid out in the West Overburden Lay-down area. Lift 32A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 11/04/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 60' wide by 120' long. 8 composite samples were collected with one of those samples being a duplicate. The samples were submitted to the WCL on 11/04/10 at 15:00 hrs under COC #1-1076. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-055. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 4088 cpm
Gamma Count Rate Range : 3182 - 5410 cpm
Gamma Count Rate STD DEV : 366 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/18/10)

Sample concentration Average: 3.41 pCi/g
Sample concentration Range : 1.73 – 4.95 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

Parcel Number: 1-1076 Kress Creek Reach 7 Overburden Lift #KC-R7-110410-OB-32A (West Area): COC# 1-1076, November 4, 2010																				
Sample I.D.	Grid #	Sample Point	Result	Error	Tl-208		Bi-212		Ac-228		Bi-214		Pb-214		Ra-228		Ra-226		TOTAL	
					Result	Error	TOTAL													
104320	1-W	COMPOSITE	2.31	0.23	2.75	0.54	3.13	0.17	1.46	0.12	1.17	0.11	2.83	1.30	4.13	4.13	4.13	4.13	4.13	4.13
104321	2-W	COMPOSITE	3.38	0.31	3.72	0.72	4.12	0.21	1.06	0.12	1.07	0.11	3.88	1.06	4.95	4.95	4.95	4.95	4.95	4.95
104322	3-W	COMPOSITE	2.67	0.26	2.95	0.58	3.41	0.18	0.80	0.09	0.75	0.09	3.15	0.77	3.93	3.93	3.93	3.93	3.93	3.93
104323	4-W	COMPOSITE	1.92	0.20	2.07	0.51	2.13	0.14	0.71	0.08	0.67	0.08	2.06	0.69	2.75	2.75	2.75	2.75	2.75	2.75
104324	5-W	COMPOSITE	1.03	0.12	1.59	0.37	1.20	0.10	0.57	0.07	0.58	0.07	1.16	0.58	1.73	1.73	1.73	1.73	1.73	1.73
104326	6-W	COMPOSITE	2.48	0.25	1.80	0.51	3.03	0.16	0.72	0.09	0.69	0.08	2.79	0.70	3.49	3.49	3.49	3.49	3.49	3.49
104327	7-W	COMPOSITE	2.01	0.21	2.09	0.49	2.41	0.14	0.63	0.08	0.63	0.07	2.27	0.63	2.90	2.90	2.90	2.90	2.90	2.90

INFORMATION
ONLY

Lift Average



Stephanie Johnson

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 11/4/2010

PILE #: KC-R7-OB32 Est. Volume of Pile in Cubic Yards: 188

Number of Samples
Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB32-A	1.63					
KC-R7-OB32-B	1.78					
KC-R7-OB32-C	2.97					
KC-R7-OB32-D	3.24					
KC-R7-OB32-E	4.77					
KC-R7-OB32-F (QC-E)			3.95	0.35	0.15	0.25

Number of Samples (n) 5

Average (Mean of the sample population) (X_{bar}) 2.88

Standard Deviation of sample population (S_1) 1.14

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12

Check if QC Sample Dup. is within 3 Standard Deviations (3 S_{dup}) of the mean of the sample population, per SOP 214, paragraph 11.1	
$3 \times S_{dup} =$ $Mean + 3 S_{dup} =$ $Mean - 3 S_{dup} =$	<u>3.50</u> <u>6.38</u> <u>-0.62</u> O.K. O.K.

U_α (True Mean) = $(X_{bar}) + (t^* (S_1 / \sqrt{n}))$
 Where t^* is a statistic used for small sample tests
 of hypotheses (the Student Distribution), from
 SOP No. KMS-102, Attachment 10.6

Release Criteria 7.20

$U_\alpha <$ Release Criteria?
U_a < Release Criteria?

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
 LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
 AS ONSITE BACKFILL PER SOP-214

Michael F. Snuffy 11/08/2010

Michael F. Snuffy 11/08/2010

Name/date

REVIEWED: SES/ARCADIS

APPROVED: OFFSITES MANAGER:

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Friday, November 19, 2010 11:20 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110410-OB-33A Verification
Attachments: KC-R7-110410-OB-33A_1077.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Mike,

Please find the verification information for OB lift #KC-R7-110410-OB-33A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/19/2010 11:19 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/19/2010 10:23 AM
Subject: Overburden Lift #KC-R7-110410-OB-33A Verification

On 11/04/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110410-OB-33A which was laid out in the North Overburden Lay-down area. Lift 33A was surveyed as a whole 6" lift. The lay-down area was segregated into 8 grids and was designated as a 6" lift (A-level) on 11/04/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 45' wide by 200' long. 9 composite samples were collected which included 1 duplicate. The samples were submitted to the WCL on 11/04/10 at 15:00 hrs under COC #1-1077. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-055. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 4093 cpm
Gamma Count Rate Range : 3083 - 5351 cpm
Gamma Count Rate STD DEV : 446 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/19/10)

Sample concentration Average: 4.28 pCi/g
Sample concentration Range: 2.84 – 5.91 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Sample I.D.	Grid #	Sample Point	Result	Error	Tl-208		Bi-212		Ac-228		Bi-214		Pb-214		Ra-228		Ra-226		TOTAL	
					Result	Error														
104328	1-N	COMPOSITE	4.17	0.44	4.61	1.23	4.90	0.29	1.21	0.16	1.26	0.14	4.67	1.24	5.91					
104329	2-N	COMPOSITE	3.71	0.40	3.06	1.04	4.50	0.28	1.69	0.19	1.41	0.16	4.18	1.53	5.71					
104330	3-N	COMPOSITE	2.20	0.25	2.40	0.76	2.29	0.19	0.58	0.09	0.57	0.10	2.26	0.57	2.84					
104331	4-N	COMPOSITE	2.76	0.31	2.64	0.68	3.11	0.22	0.68	0.12	0.87	0.13	2.97	0.77	3.74					
104332	5-N	COMPOSITE	2.33	0.26	2.90	0.82	2.73	0.19	0.62	0.10	0.57	0.10	2.60	0.60	3.20					
104333	6-N	COMPOSITE	3.02	0.34	3.32	0.97	3.63	0.24	0.68	0.12	0.75	0.12	3.42	0.72	4.14					
104334	7-N	COMPOSITE	2.86	0.30	3.06	0.75	3.20	0.22	0.70	0.11	0.67	0.12	3.08	0.69	3.77					
104336	8-N	COMPOSITE	3.88	0.34	4.30	0.73	4.34	0.21	0.77	0.10	0.62	0.10	4.22	0.70	4.91					

**INFORMATION
ONLY**

Lift Average	14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-1-2-3-4-5-6-7-8-9-10-11-12-13	4.28
	ILLINOIS STATE LABORATORY	

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 11/4/2010

PILE #: KC-R7-OB33 Est. Volume of Pile in Cubic Yards: 130

Number of Samples
5
 Required Per SOP 214:

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB33-A	3.05					
KC-R7-OB33-B	3.42					
KC-R7-OB33-C	2.81					
KC-R7-OB33-D	2.77					
KC-R7-OB33-E	4.01					
KC-R7-OB33-F (QC-E)	—	4.54	0.37	0.21	0.29	0.54

Number of Samples (n) 5

Average (Mean of the sample population) (\bar{X} bar) 3.21

5

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12

Check if QC Sample Dup. is within 3 Standard Deviations ($3 S_{dup}$) of the mean of the sample population, per SOP 214, paragraph 11.1	
$3 \times S_{dup} =$	1.62

Mean + $3 S_{dup} =$

Mean - $3 S_{dup} =$

4.84

1.59

QC < (\bar{X} Mean + $3 S_{dup}$)?

QC > (\bar{X} Mean - $3 S_{dup}$)?

O.K.

O.K.

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ONSITE BACKFILL PER SOP-214	
U _a < Release Criteria?	7.20
U _a (True Mean) = (\bar{X} bar) + (t^* * ($S_2 / \text{sqrt}(n)$))	3.65
Where " t^* " is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	2.132
Release Criteria	7.20

REVIEWED: SES/ARCADIS
 APPROVED: OFFSITES MANAGER:

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ONSITE BACKFILL PER SOP-214

11/08/2010

Michael J. Smoak

John E. Smith

Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 30, 2010 11:44 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110610-OB-34A Verification
Attachments: KC-R7-110610-OB-34A_1078.pdf

Mike,

Please find the verification information for OB lift #KC-R7-110610-OB-34A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/30/2010 11:43 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/19/2010 02:49 PM
Subject: Overburden Lift #KC-R7-110610-OB-34A Verification

On 11/06/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110610-OB-34A which was laid out in the West Overburden Lay-down area. Lift 34A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 11/06/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 60' wide by 120' long. 7 composite samples were collected. The samples were submitted to the WCL on 11/06/10 at 17:30 hrs under COC #1-1078. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-057. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 3856 cpm
Gamma Count Rate Range : 3056 - 6481 cpm
Gamma Count Rate STD DEV : 555 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/19/10)

Sample concentration Average: 4.09 pCi/g
Sample concentration Range : 3.68 – 4.58 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer

Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

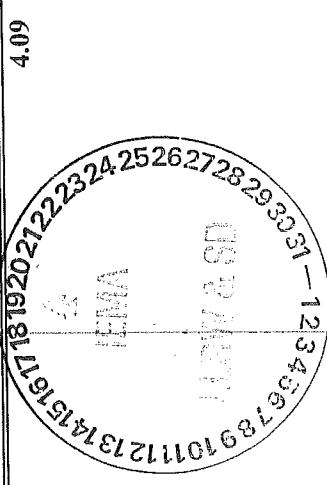
Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

Parcel Number:	Grid #	Sample Point	Result	Error	Bi-208	Bi-212	Ac-228	Bi-214	Pb-214	Ra-228	Ra-226	TOTAL
104337	1-W	COMPOSITE	2.76	0.27	3.22	0.73	3.66	0.19	0.83	0.10	0.80	0.09
104338	2-W	COMPOSITE	3.51	0.38	3.38	0.93	3.92	0.26	0.78	0.12	0.85	0.14
104339	3-W	COMPOSITE	2.36	0.29	2.30	0.83	3.06	0.22	1.03	0.13	0.89	0.11
104340	4-W	COMPOSITE	2.65	0.31	3.19	0.87	3.03	0.23	0.75	0.12	0.80	0.12
104341	5-W	COMPOSITE	2.88	0.32	2.99	0.84	3.56	0.24	0.85	0.13	0.84	0.13
104342	6-W	COMPOSITE	3.03	0.34	3.85	0.86	3.53	0.24	0.92	0.12	0.94	0.13
104343	7-W	COMPOSITE	2.63	0.33	3.22	0.96	3.37	0.23	0.85	0.13	0.86	0.13

INFORMATION
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Lift Average

4.09



John St. John

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 11/5/2010

PILE #: KC-R7-OB34 Est. Volume of Pile in Cubic Yards: 188

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	S_2	S_{dup}
KC-R7-OB34-A	5.71					
KC-R7-OB34-B	4.72					
KC-R7-OB34-C	5.01					
KC-R7-OB34-D	4.23					
KC-R7-OB34-E	4.15					
KC-R7-OB34-F (QC-A)	-----		5.11	0.43	0.25	0.34
Number of Samples (n)	5					
Average (Mean of the sample population) (X bar)	4.76					

Standard Deviation of sample population (S_s)	0.57	"t" value 2.132	$3 \times S_{dup} =$ 1.99
U_α ('True Mean') = $(X \text{ bar}) + (t * (S_s / \sqrt{n}))$ Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	5.31		$\text{Mean} + 3 S_{dup} =$ 6.75
Release Criteria	7.20		$\text{Mean} - 3 S_{dup} =$ 2.77
$U_\alpha < \text{Release Criteria?}$			$QC < (\text{Mean} + 3 S_{dup})?$ O.K.
			$QC > (\text{Mean} - 3 S_{dup})?$ O.K.
SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214			

REVIEWED: SES/ARCADIS Michael F. Salvaggio 11/09/2010
 APPROVED: OFFSITES MANAGER: John J. John 11-10-10
 Name/date _____
 Name/date _____

Michael F. Salvaggio 11/09/2010

Name/date _____
 Name/date _____

Number of Samples
Required Per SOP 214:
5

Check if QC Sample Dup. is within 3 Standard Deviations (3 S_{dup}) of the mean of the sample population, per SOP 214, paragraph 11.1
$S_{dup} = \sqrt{(S_1^2 + S_2^2)} =$ <u>0.66</u>

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 30, 2010 11:45 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110610-OB-35A Verification
Attachments: KC-R7-110610-OB-35A_1079.pdf

Mike,

Please find the verification information for OB lift #KC-R7-110610-OB-35A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/30/2010 11:44 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/29/2010 09:21 AM
Subject: Overburden Lift #KC-R7-110610-OB-35A Verification

On 11/06/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110610-OB-35A which was laid out in the East Overburden Lay-down area. Lift 35A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 11/06/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that another lift could not be laid out over this 6" lift. The GPS gamma walkover surveys were performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The lift area was approximately 80' wide by 120' long. 12 samples were collected with 2 of the samples being duplicates. The samples were submitted to the WCL on 11/06/10 at 17:30 hrs under COC #1-1079. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-057. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary (Lift #35A)

Gamma Count Rate Average : 3976 cpm
Gamma Count Rate Range : 3152 - 4668 cpm
Gamma Count Rate STD DEV : 225 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/22/10)

Sample concentration Average: 4.50 pCi/g
Sample concentration Range : 4.10 – 4.96 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM, LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

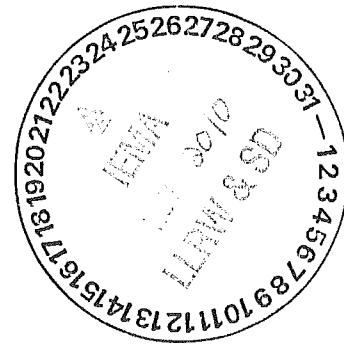
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Sample I.D.	Grid #	Sample Point	Result	Error	Result	Error	Result	Error	Result	Error	Ra-228	Ra-226	TOTAL	
104344	1-E	COMPOSITE	2.61	0.26	3.51	0.70	3.67	0.19	1.01	0.11	0.96	0.10	3.31	0.98
104346	2-E	COMPOSITE	3.10	0.34	2.96	1.02	4.11	0.26	0.89	0.13	0.75	0.12	3.70	0.82
104347	3-E	COMPOSITE	2.85	0.33	2.89	0.75	4.03	0.25	0.83	0.13	0.95	0.13	3.54	0.89
104348	4-E	COMPOSITE	2.81	0.26	2.65	0.64	3.79	0.20	0.72	0.09	0.70	0.08	3.39	0.71
104349	5-E	COMPOSITE	2.82	0.27	2.76	0.67	3.80	0.19	0.74	0.10	0.66	0.10	3.43	0.70
104350	6-E	COMPOSITE	2.91	0.28	3.14	0.70	3.90	0.20	0.80	0.10	0.80	0.09	3.55	0.80
104351	7-E	COMPOSITE	3.32	0.31	3.64	0.66	4.55	0.21	0.84	0.10	0.82	0.09	4.13	0.83
104352	8-E	COMPOSITE	3.51	0.31	3.73	0.70	4.03	0.21	0.94	0.11	0.94	0.09	3.86	0.94
104353	9-E	COMPOSITE	3.33	0.31	3.19	0.77	4.18	0.20	0.87	0.10	0.90	0.10	3.89	0.88
104354	10-E	COMPOSITE	2.89	0.27	2.93	0.69	4.27	0.20	0.97	0.11	0.91	0.10	3.73	0.94

Lift Average

4.50

INFORMATION
ONLY



[Handwritten signature]

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 11/5/2010

PILE #: KC-R7-OB35

Est. Volume of Pile in Cubic Yards: 170

Number of Samples Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	S_2	S_{dup}
KC-R7-OB35-A	5.45					
KC-R7-OB35-B	4.88					
KC-R7-OB35-C	4.69					
KC-R7-OB35-D	3.96					
KC-R7-OB35-E	3.80					
KC-R7-OB35-F (QC-B)	-----	4.80	0.42	2.06	1.24	
Number of Samples (n)	5					
Average (Mean of the sample population) (\bar{X} bar)	4.55					

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12	Standard Deviation of sample population (S_1)	0.61	"t" value	2.732	$QC < (\text{Mean} + 3S_{dup})?$	O.K.
$U_\alpha (\text{True Mean}) = (\bar{X} \text{ bar}) + (t * (S_1/\sqrt{n}))$ Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	Release Criteria	5.13	Mean + 3 S_{dup} =	8.69	$QC > (\text{Mean} - 3S_{dup})?$	O.K.

Check if QC Sample Dup. is within 3 Standard Deviations ($3 S_{dup}$) of the mean of the sample population, per SOP 214, paragraph 11.1	$3 \times S_{dup} =$	4.14
	Mean + 3 S_{dup} =	8.69
	Mean - 3 S_{dup} =	0.42
	$S_{dup} = \sqrt{(S_1^2 + S_2^2)} =$	1.38

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214		
REVIEWED: SES/ARCADIS	<u>John M. Wolf</u>	Name/date
APPROVED: OFFSITES MANAGER:	<u>John M. Wolf</u>	Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 30, 2010 11:45 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110610-OB-36A Verification
Attachments: KC-R7-110610-OB-36A_1080.pdf

Mike,

Please find the verification information for OB lift #KC-R7-110610-OB-36A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/30/2010 11:44 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/29/2010 09:43 AM
Subject: Overburden Lift #KC-R7-110610-OB-36A Verification

On 11/06/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110610-OB-36A which was laid out in the North Overburden Lay-down area. Lift36A was surveyed as a whole 6" lift. The lay-down area was segregated into 8 grids and was designated as a 6" lift (A-level) on 11/06/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 45' wide by 200' long. 8 composite samples were collected with no duplicates collected. The samples were submitted to the WCL on 11/06/10 at 17:30 hrs under COC #1-1080. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-057. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 4149 cpm
Gamma Count Rate Range : 3206 - 6808 cpm
Gamma Count Rate STD DEV : 735 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/22/10)

Sample concentration Average: 4.61 pCi/g
Sample concentration Range : 3.11 – 5.71 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

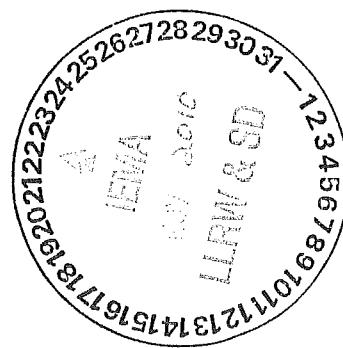
Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Parcel Number:	Grid #	Sample Point	Result	Error	Bi-208			Bi-212			Ac-228			Bi-214			Pb-214			Ra-228			Ra-226		
					Result	Error	Result	Result	Error	Result	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result
104356	1-N	COMPOSITE	3.01	0.28	2.88	0.65	4.25	0.21	0.72	0.10	0.79	0.09	0.99	0.09	3.74	0.76	0.76	0.09	4.50	0.50	0.50	0.09	3.11	0.59	
104357	2-N	COMPOSITE	2.17	0.23	2.04	0.65	2.73	0.16	0.61	0.09	0.58	0.07	0.58	0.07	2.52	0.59	0.59	0.07	3.11	0.59	0.59	0.07	3.11	0.59	
104358	3-N	COMPOSITE	2.58	0.26	2.88	0.57	3.75	0.18	0.60	0.08	0.66	0.09	0.66	0.09	3.33	0.63	0.63	0.09	3.96	0.63	0.63	0.09	3.96	0.63	
104359	4-N	COMPOSITE	3.12	0.34	2.73	1.03	3.45	0.24	0.87	0.12	0.92	0.14	0.92	0.14	3.32	0.89	0.89	0.14	4.21	0.89	0.89	0.14	4.21	0.89	
104360	5-N	COMPOSITE	2.95	0.29	3.13	0.59	4.01	0.20	0.80	0.10	0.87	0.09	0.87	0.09	3.63	0.84	0.84	0.09	4.47	0.84	0.84	0.09	4.47	0.84	
104361	6-N	COMPOSITE	3.78	0.39	3.91	1.10	4.47	0.28	1.35	0.16	1.30	0.16	1.30	0.16	4.22	1.33	1.33	0.16	5.54	1.33	1.33	0.16	5.54	1.33	
104362	7-N	COMPOSITE	3.73	0.42	4.57	0.99	4.25	0.29	1.67	0.18	1.54	0.18	1.54	0.18	4.11	1.61	1.61	0.18	5.71	1.61	1.61	0.18	5.71	1.61	
104363	8-N	COMPOSITE	3.76	0.40	4.59	1.10	4.12	0.29	1.34	0.15	1.42	0.19	1.42	0.19	4.02	1.37	1.37	0.19	5.40	1.37	1.37	0.19	5.40	1.37	

INFORMATION
ONLY

Lift Average

4.61



John Blahnik

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 11/5/2010

PILE #: KC-R7-OB36 Est. Volume of Pile in Cubic Yards: 130

Number of Samples
Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	S_2	S_{dup}
KC-R7-OB36-A	6.86					
KC-R7-OB36-B	4.71					
KC-R7-OB36-C	4.47					
KC-R7-OB36-D	3.70					
KC-R7-OB36-E	4.48					
KC-R7-OB36-F (QC-A)	-----	6.73	0.52	0.25	0.38	
Number of Samples (n)	<u>5</u>					
Average (Mean of the sample population) (X bar)	<u>4.85</u>					

Average of samples is <7.2 pCi/g, Proceed with Confidence Level Check described in
SOP-214, Paragraph 6.12

Check if QC Sample Dup. is within 3 Standard Deviations ($3 S_{dup}$) of the mean of the sample population, per SOP 214, paragraph 11.1	
$3 \times S_{dup} =$	<u>3.39</u>

Standard Deviation of sample population (S_1)
 $U_\alpha (\text{True Mean}) = (X \text{ bar}) + (t * (S_1 / \sqrt{n}))$
 Where " t " is a statistic used for small sample tests
 or hypotheses (the Student Distribution), from
 SOP No. KMS-102, Attachment 10.6

Release Criteria
 $U_\alpha < \text{Release Criteria?}$
7.20

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
 LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
 AS ON SITE BACKFILL PER SOP-214

Dale M. Goss / Michael F. Sandoval 11/09/2010

Name/date
Michael F. Sandoval 11-10-10

Name/date

REVIEWED: SES/ARCADIS

APPROVED: OFFSITES MANAGER:

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 30, 2010 11:46 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110610-OB-37A Verification (Correction)
Attachments: KC-R7-110610-OB-37A_1081.pdf

Mike,

Please find the verification information for OB lift #KC-R7-110610-OB-37A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/30/2010 11:45 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/29/2010 11:08 AM
Subject: Overburden Lift #KC-R7-110610-OB-37A Verification (Correction)

On 11/06/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110610-OB-37A which was laid out in the West Overburden Lay-down area. Lift 37A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 11/06/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 Nal(TL) detector. The total lift area was approximately 60' wide by 120' long. 8 composite samples were collected with one of those samples being a duplicate. The samples were submitted to the WCL on 11/06/10 at 17:30 hrs under COC #1-1081. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-057. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average: 3361 cpm
Gamma Count Rate Range : 2589 - 4074 cpm
Gamma Count Rate STD DEV : 241 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/22/10)

Sample concentration Average: 3.99 pCi/g
Sample concentration Range : 3.33 – 5.17 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer

Senior Health Physicist
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(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

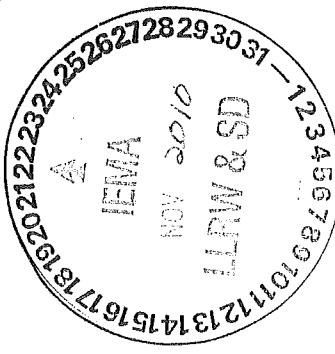
Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

Parcel Number:	Grid #	Sample Point	Tl-208			Bi-212			Ac-228			Bi-214			Pb-214			TOTAL		
			Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error		
104364	1-W	COMPOSITE	2.53	0.26	2.54	0.56	3.48	0.18	0.96	0.11	0.92	0.10	3.14	0.94	4.07					
104366	2-W	COMPOSITE	2.18	0.27	2.74	0.90	2.85	0.20	0.90	0.12	0.79	0.11	2.62	0.84	3.45					
104367	3-W	COMPOSITE	2.42	0.28	2.20	0.78	2.60	0.19	0.84	0.11	0.77	0.11	2.53	0.81	3.33					
104368	4-W	COMPOSITE	2.37	0.29	3.00	0.74	3.12	0.22	0.89	0.12	0.91	0.12	2.85	0.90	3.76					
104369	5-W	COMPOSITE	3.45	0.33	3.35	0.73	4.57	0.22	1.03	0.11	0.96	0.10	4.18	0.99	5.17					
104370	6-W	COMPOSITE	2.01	0.26	2.26	0.82	2.61	0.21	1.11	0.15	0.92	0.13	2.38	1.00	3.38					
104371	7-W	COMPOSITE	3.04	0.36	3.16	0.98	4.03	0.27	1.11	0.15	1.13	0.14	3.64	1.12	4.76					

**INFORMATION
ONLY**

Lift Average

3.99



Stephanie B. Shaffer

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 11/6/2010
 PILE #: KC-R7-OB37 Est. Volume of Pile in Cubic Yards: 188

Number of Samples
5
Required Per SOP 214:

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Th 232)	2 sigma uncertainty (Ra 226)	S_2	S_{dup}
KC-R7-OB37-A	4.37					
KC-R7-OB37-B	4.10					
KC-R7-OB37-C	4.31					
KC-R7-OB37-D	3.96					
KC-R7-OB37-E	4.34					
KC-R7-OB37-F (QC-E)			4.34	0.39	0.23	0.31

Number of Samples (n) 5

Average (Mean of the sample population) (\bar{X} bar) 4.21

Average of samples is < 7.2 pCi/g, Proceed with Confidence Level Check described in
SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_s) 0.16

U_L (**True Mean**) = $(\bar{X}$ bar) + $(t * (S_s / \sqrt{n}))$
 Where " t " is a statistic used for small sample tests
 of hypotheses (the Student Distribution), from
 SOP No. KMS-102, Attachment 10.6

Release Criteria

7.20

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
 LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
 AS ON SITE BACKFILL PER SOP-214

$U_u < \text{Release Criteria?}$

REVIEWED: SES/ARCADIS

Michael F. Sharp 11/11/2010

Name/date

APPROVED: OFFSITES MANAGER:

John H. Hiltz 11/11/2010

Name/date

Check if QC Sample Dup. is within 3 Standard Deviations ($3 S_{dup}$) of the mean of the sample population, per SOP 214, paragraph 11.1	
$3 \times S_{dup} =$ <u>1.05</u>	Mean + $3 S_{dup} =$ <u>5.26</u> Mean - $3 S_{dup} =$ <u>3.17</u>

QC < (Mean + $3 S_{dup}$)? O.K.
 QC > (Mean - $3 S_{dup}$)? O.K.

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 30, 2010 11:47 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110810-OB-38A Verification
Attachments: KC-R7-110810-OB-38A_1082.pdf

Mike,

Please find the verification information for OB lift #KC-R7-110810-OB-38A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/30/2010 11:46 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/29/2010 12:00 PM
Subject: Overburden Lift #KC-R7-110810-OB-38A Verification

On 11/08/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110810-OB-38A which was laid out in the West Overburden Lay-down area. Lift 38A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 11/08/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 60' wide by 120' long. 8 composite samples were collected which included 1 duplicate sample. The samples were submitted to the WCL on 11/08/10 at 17:00 hrs under COC #1-1082. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-058. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 3753 cpm
Gamma Count Rate Range : 2895 - 5041 cpm
Gamma Count Rate STD DEV : 397 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/24/10)

Sample concentration Average: 5.05 pCi/g
Sample concentration Range : 3.85 – 6.23 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

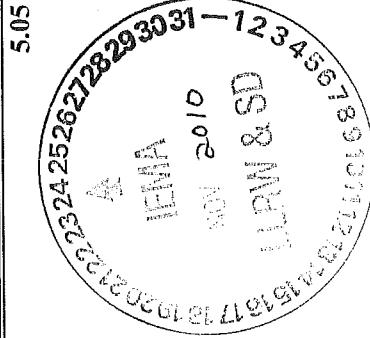
Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

Parcel Number:	Grid #	Sample Point	Result	Error	Ti-208			Ac-228			Bi-214			Pb-214			TOTAL
					Result	Error	Result	Result	Error	Result	Result	Result	Error	Result	Error	Result	
104372	1-W	COMPOSITE	2.95	0.29	3.70	0.74	3.77	0.20	0.77	0.10	0.69	0.09	3.51	0.73	4.24		
104373	2-W	COMPOSITE	2.49	0.25	2.74	0.71	3.28	0.18	0.89	0.09	0.80	0.10	3.00	0.85	3.85		
104374	3-W	COMPOSITE	2.69	0.26	3.52	0.61	3.35	0.18	1.17	0.11	1.11	0.10	3.17	1.14	4.31		
104376	4-W	COMPOSITE	4.85	0.42	5.49	0.87	5.23	0.25	1.06	0.11	1.10	0.12	5.15	1.08	6.23		
104377	5-W	COMPOSITE	4.54	0.38	4.85	0.86	4.88	0.23	1.01	0.12	1.01	0.12	4.79	1.01	5.81		
104378	6-W	COMPOSITE	3.52	0.31	3.71	0.66	4.15	0.20	0.97	0.10	0.98	0.10	3.95	0.97	4.93		
104379	7-W	COMPOSITE	4.58	0.39	4.68	0.84	5.03	0.23	1.07	0.12	1.12	0.12	4.90	1.10	6.00		

INFORMATION
ONLY

Lift Average



5.05

[Handwritten signature]

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7
 Date Sampled: 11/3/2010

PILE #: KC-R7-OB38 Est. Volume of Pile in Cubic Yards: 170

Number of Samples
 Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	S_2	S_{dup}
KC-R7-OB38-A	4.29					
KC-R7-OB38-B	4.63					
KC-R7-OB38-C	3.94					
KC-R7-OB38-D	3.43					
KC-R7-OB38-E	3.64					
KC-R7-OB38-F (QC-B)	—	4.09	0.41	0.19	0.30	
Number of Samples (n)	<u>5</u>					
Average (Mean of the sample population) (X bar)	<u>3.98</u>					

$U_\alpha < \text{Release Criteria?}$

Standard Deviation of sample population (S_1)	0.43	$t_{\alpha}^{\text{value}}$	$t_{\alpha}^{\text{value}}$	$U_\alpha = (\text{Mean}) + (t_{\alpha} * (S_1 / \sqrt{n}))$	$U_\alpha = (3.98) + (2.776 * (0.43 / \sqrt{5}))$	$U_\alpha = 4.40$	$\text{SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -}$ $\text{LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE}$ $\text{AS ON SITE BACKFILL PER SOP-214}$
Release Criteria	7.20						

Check if QC Sample Dup. is within 3 Standard Deviations ($3 S_{dup}$) of the mean of the sample population, per SOP 214, Paragraph 11.1	
$3 \times S_{dup} =$	1.58

Mean + $3 S_{dup}$ =	5.56	$QC < (\text{Mean} + 3S_{dup})?$	O.K.
Mean - $3 S_{dup}$ =	2.41	$QC > (\text{Mean} - 3S_{dup})?$	O.K.

REVIEWED: SES/ARCADIS
 File #: STP 6.2

APPROVED: OFFSITES MANAGER:

John R. Michael F. Savard Name/date
11-10-10 Name/date

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 30, 2010 11:47 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110810-OB-39A Verification
Attachments: KC-R7-110810-OB-39A_1083.pdf

Mike,

Please find the verification information for OB lift #KC-R7-110810-OB-39A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/30/2010 11:46 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/29/2010 12:14 PM
Subject: Overburden Lift #KC-R7-110810-OB-39A Verification

On 11/08/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110810-OB-39A which was laid out in the East Overburden Lay-down area. Lift 39A was surveyed as a whole 6" lift. The lay-down area was segregated into 10 grids and was designated as a 6" lift (A-level) on 11/08/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that another lift could not be laid out over this 6" lift. The GPS gamma walkover surveys were performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 Nal(TL) detector. The lift area was approximately 80' wide by 120' long. 11 samples were collected with 1 of the samples being a duplicate. The samples were submitted to the WCL on 11/08/10 at 17:00 hrs under COC #1-1083. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-058. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary (Lift #39A)

Gamma Count Rate Average : 3663 cpm
Gamma Count Rate Range : 2981 – 4769 cpm
Gamma Count Rate STD DEV : 360 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/24/10)

Sample concentration Average: 3.65 pCi/g
Sample concentration Range : 2.94 – 5.45 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM, LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago

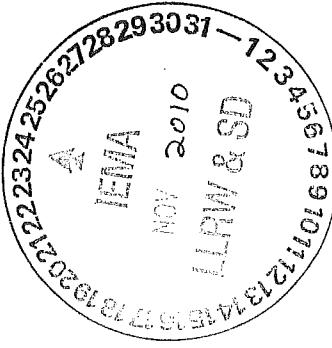
Illinois Emergency Management Agency/Division of Nuclear Safety
 West Chicago Soil Sample Results
 {pCi/gm}

Parcel Number:	Grid #	Sample Point	Lift #KC-R7-110810-OB-39A (East Area): COC# 1-1083; November 8, 2010						TOTAL						
			Tl-208	Bi-212	Ac-228	Pb-214	Bi-214	Result	Error						
104380	1-E	COMPOSITE	3.66	0.33	3.83	0.67	4.93	0.22	1.00	0.11	0.92	0.10	4.50	0.95	5.45
104381	2-E	COMPOSITE	2.73	0.26	3.44	0.67	3.90	0.18	1.07	0.10	0.89	0.09	3.50	0.96	4.46
104382	3-E	COMPOSITE	1.89	0.20	2.18	0.53	2.50	0.14	0.67	0.08	0.64	0.07	2.29	0.65	2.94
104383	4-E	COMPOSITE	2.25	0.23	2.30	0.70	3.22	0.17	0.58	0.08	0.60	0.09	2.85	0.59	3.44
104384	5-E	COMPOSITE	2.47	0.25	3.20	0.58	2.87	0.16	0.79	0.09	0.75	0.09	2.78	0.77	3.54
104386	6-E	COMPOSITE	2.36	0.25	2.40	0.67	3.33	0.18	0.78	0.09	0.73	0.09	2.96	0.76	3.72
104387	7-E	COMPOSITE	2.59	0.25	2.13	0.75	3.53	0.19	0.69	0.09	0.67	0.09	3.15	0.68	3.83
104388	8-E	COMPOSITE	1.96	0.21	2.40	0.56	2.64	0.15	0.61	0.08	0.64	0.07	2.41	0.62	3.03
104389	9-E	COMPOSITE	1.79	0.20	1.80	0.55	2.64	0.15	0.66	0.09	0.67	0.07	2.30	0.67	2.97
104390	10-E	COMPOSITE	2.10	0.21	2.04	0.51	2.66	0.15	0.60	0.08	0.65	0.07	2.44	0.63	3.07

INFORMATION
ONLY

Lift Average

3.65



[Handwritten signature]

OVERBURDEN PILE SAMPLING

Excavation Area:	<u>Reach 7</u>	Number of Samples Required Per SOP 214:	<u>5</u>
Date Sampled:	<u>11/8/2010</u>		
PILE # :	<u>KC-R7-OB39</u>	Est. Volume of Pile in Cubic Yards:	<u>188</u>
Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	S_2
KC-R7-OB39-A	4.56	2 sigma uncertainty (Ra 226)	Std. Dev. for the analyses of the duplicate sample
KC-R7-OB39-B	4.65		Std. Dev. of the duplicate sampling & measurement
KC-R7-OB39-C	4.69		
KC-R7-OB39-D	4.12		
KC-R7-OB39-E	5.18		
KC-R7-OB39-F (QC-E)	—	5.02	0.42
Number of Samples (n)	<u>5</u>		$S_{dup} = \sqrt{(S_1^2 + S_2^2)} =$
Average (Mean of the sample population) (X bar)	<u>4.64</u>		<u>0.47</u>
Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12			
Standard Deviation of sample population (S_1)	0.34	$3 \times S_{dup} =$	1.40
U_α (True Mean) = $(X \text{ bar}) + (t * (S_1 / \sqrt{n}))$ Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	4.96	Mean + 3 S_{dup} =	6.04
Release Criteria	7.20	Mean - 3 S_{dup} =	3.24
SAMPLES TESTED MEET 95% CONFIDENCE LEVEL - LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ONSITE BACKFILL PER SOP-214			
U _a < Release Criteria?		QC < (Mean + 3 S_{dup})?	O.K.
		QC > (Mean - 3 S_{dup})?	O.K.

Michael F. Savoy 11/11/2010
Michael F. Savoy Name/date
Frank Johnson 11/11/2010
Frank Johnson Name/date

REVIEWED: SES/ARCADIS

APPROVED: OFFSITES MANAGER:

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 30, 2010 11:48 AM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110910-OB-40A Verification
Attachments: KC-R7-110910-OB-40A_1084.pdf

Mike,

Please find the verification information for OB lift #KC-R7-110910-OB-40A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/30/2010 11:47 AM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/30/2010 07:11 AM
Subject: Overburden Lift #KC-R7-110910-OB-40A Verification

On 11/09/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110910-OB-40A which was laid out in the North Overburden Lay-down area. Lift 40A was surveyed as a whole 6" lift. The lay-down area was segregated into 8 grids and was designated as a 6" lift (A-level) on 11/09/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 Nal(TL) detector. The total lift area was approximately 45' wide by 200' long. 9 composite samples were collected with 1 of those samples being a duplicate sample. The samples were submitted to the WCL on 11/09/10 at 13:50 hrs under COC #1-1084. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-059. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. **However, it should be noted that the analytical result of the Grid # 2-N sample exceeded the 7.2 pCi/g cleanup criteria by 0.17 pCi/g.** If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average) : 4167 cpm
Gamma Count Rate Range : 3460 - 5845 cpm
Gamma Count Rate STD DEV : 410 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/29/10)

Sample concentration Average: 5.27 pCi/g
Sample concentration Range : 4.35 – 7.37 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Parcel Number:

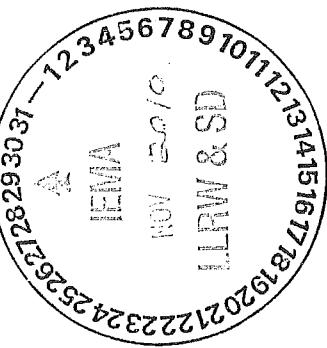
11084 Kress Creek Reach 7 Overburden Lift #KC-R7-110910-OB-40A (North Area): COC# 1-1084, November 9, 2010

Sample I.D.	Grid #	Sample Point	Result	Error	TOTAL												
104391	1-N	COMPOSITE	3.73	0.33	4.11	0.73	4.44	0.21	1.41	0.12	1.39	0.12	4.23	1.40	5.63		
104392	2-N	COMPOSITE	4.94	0.41	5.90	0.85	5.77	0.25	1.84	0.15	1.77	0.15	5.57	1.80	7.37		
104393	3-N	COMPOSITE	4.27	0.38	4.74	0.82	4.86	0.23	1.58	0.14	1.27	0.11	4.70	1.40	6.10		
104394	4-N	COMPOSITE	2.76	0.27	3.51	0.69	3.89	0.19	0.94	0.10	1.00	0.10	3.51	0.97	4.48		
104396	5-N	COMPOSITE	3.04	0.28	3.08	0.77	3.98	0.19	0.95	0.10	0.92	0.10	3.65	0.94	4.59		
104397	6-N	COMPOSITE	2.69	0.26	2.61	0.63	3.87	0.19	1.05	0.11	1.14	0.11	3.41	1.10	4.51		
104398	7-N	COMPOSITE	2.43	0.27	2.91	0.77	3.33	0.20	2.15	0.16	2.17	0.16	2.99	2.16	5.15		
104399	8-N	COMPOSITE	2.22	0.25	2.29	0.69	3.22	0.19	1.53	0.13	1.54	0.14	2.82	1.53	4.35		

**INFORMATION
ONLY**

Lift Average

5.27



Stephen Stober

OVERBURDEN PILE SAMPLING

Excavation Area: _____ Reach 7
 Date Sampled: 11/8/2010

PILE #: KC-R7-OB40 Est. Volume of Pile in Cubic Yards: 130

Number of Samples Required Per SOP 214:
 5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tol. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	S_z	S_{dup}
KC-R7-OB40-A	3.97				
KC-R7-OB40-B	3.75				
KC-R7-OB40-C	4.30				
KC-R7-OB40-D	5.04				
KC-R7-OB40-E	5.21				
KC-R7-OB40-F (QC-B)	4.58	0.37	0.25	0.31
Number of Samples (n)	5				
Average (Mean of the sample population) (\bar{X} bar)	4.45				

Average of samples is <7.2 pCi/g. Proceed with Confidence Level Check described in SOP-214, Paragraph 6.12

Standard Deviation of sample population (S_z)	0.58	"t" value 2.132	$3 \times S_{dup} =$ 1.97
U_t , (True Mean) = $(\bar{X} \text{ bar}) + (t * (S_z / \sqrt{n}))$	5.00		$\text{Mean} + 3 S_{dup} =$ 6.42
Where "t" is a statistic used for small sample tests of hypotheses (the Student Distribution), from SCP No. KMS-102, Attachment 10.6			$\text{Mean} - 3 S_{dup} =$ 2.48
Release Criteria	7.20		QC < (Mean + 3S _{dup})? QC > (Mean - 3S _{dup})?
			O.K. O.K.

SAMPLES TESTED MEET 95% CONFIDENCE LEVEL -
 LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE
 AS ONSITE BACKFILL PER SOP-214

$U_t < \text{Release Criteria?}$

Michael F. Sava 11/11/2010
Beth 11/11/10
John A. H. 11/11/10

REVIEWED: SES/ARCADIS

APPROVED: OFFSITES MANAGER:

Kotwicki, Joseph

From: Fischer.Timothy@epamail.epa.gov
Sent: Tuesday, November 30, 2010 4:05 PM
To: Savage, Michael
Cc: glen.anderson@tronox.com; Kotwicki, Joseph
Subject: Fw: Overburden Lift #KC-R7-110910-OB-41A Verification (Last one for Reach 7)
Attachments: KC-R7-110910-OB-41A_1085.pdf

Mike,

Please find the verification information for OB lift #KC-R7-110810-OB-41A generated by Steve Shafer of REM, LLC on behalf of IEMA.

Thanks,
Tim

----- Forwarded by TIMOTHY FISCHER/R5/USEPA/US on 11/30/2010 04:04 PM -----

From: "Shafer, Steve" <Steve.Shafer@illinois.gov>
To: "Runyon, Tim" <Tim.Runyon@illinois.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
Date: 11/30/2010 03:29 PM
Subject: Overburden Lift #KC-R7-110810-OB-38A Verification (Last one for Reach 7)

REMOVED FOR SECURITY PURPOSES

On 11/09/10, REM LLC personnel performed a verification gamma scan survey and sampling of Overburden Lift #KC-R7-110910-OB-41A which was laid out in the West Overburden Lay-down area. Lift 41A was surveyed as a whole 6" lift. The lay-down area was segregated into 7 grids and was designated as a 6" lift (A-level) on 11/09/10. Because of the high moisture content and the nature of the material it was determined by Steve Shafer (VTL) that only a 6" lift could be verified and no additional lifts would be added. The GPS gamma walkover survey was performed with a Ludlum 2221 scaler/ratemeter coupled to a six-inch shielded Ludlum 44-10 NaI(TL) detector. The total lift area was approximately 60' wide by 120' long. 8 composite samples were collected which included 1 duplicate sample. The samples were submitted to the WCL on 11/09/10 at 13:50 hrs under COC #1-1085. All supporting documentation for this survey can be found in IEMA/DNS Surveillance #10-059. During the GPS gamma walkover survey REM, LLC personnel identified no elevated areas of activity greater than the 8,000 cpm action level. If you have any questions regarding this verification please do not hesitate to call me.

Gamma Verification Survey Summary

Gamma Count Rate Average : 3601 cpm
Gamma Count Rate Range : 2866 - 4253 cpm
Gamma Count Rate STD DEV : 230 cpm

Gamma Count Rate Action Level : 8000 cpm

WCL Analytical Total Radium Results Summary (received on 11/30/10)

Sample concentration Average: 3.77 pCi/g
Sample concentration Range : 3.07 – 4.41 pCi/g

Project Remediation Objective : 7.2 pCi/g

All electronic files were placed on the W: Drive in the REM,LLC/Kress Creek/2010 directory

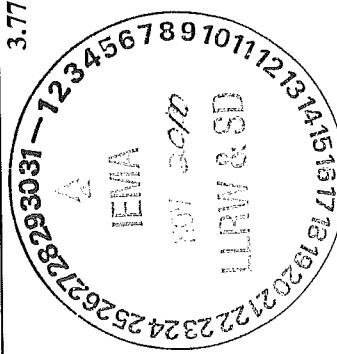
Stephen B. Shafer
Senior Health Physicist
IEMA/Radiological & Environmental Management, LLC
(630) 293-6378 West Chicago Office
(630) 293-6349 West Chicago Fax
(630) 632-5819 Cell

Illinois Emergency Management Agency/Division of Nuclear Safety
West Chicago Soil Sample Results
{pCi/gm}

Parcel Number:	11085	Kress Creek Reach 7 Overburden Lift #KC-R7-110910-OB-41A (West Area): COC# 1-1085, November 9, 2010	Pb-214														
Sample I.D.	Grid #	Sample Point	Tl-208	Bi-212	Ac-228	Br-214	Result	Error	Result	Error	Result	Error	Result	Error	Ra-228	Ra-226	TOTAL
104400	1-W	COMPOSITE	2.34	0.23	2.62	0.63	3.42	0.18	0.98	0.10	0.94	0.10	0.10	0.09	3.01	0.96	3.97
104401	2-W	COMPOSITE	2.27	0.22	2.58	0.53	3.28	0.16	0.94	0.09	0.95	0.09	0.09	0.09	2.91	0.94	3.85
104402	3-W	COMPOSITE	2.34	0.23	2.38	0.63	3.11	0.16	0.82	0.08	0.87	0.09	0.09	0.09	2.84	0.85	3.69
104403	4-W	COMPOSITE	2.47	0.23	2.63	0.66	3.40	0.17	0.69	0.08	0.66	0.08	0.08	0.08	3.05	0.68	3.73
104404	5-W	COMPOSITE	2.02	0.21	1.93	0.52	2.72	0.15	0.65	0.08	0.58	0.07	0.07	0.07	2.45	0.61	3.07
104406	6-W	COMPOSITE	2.56	0.23	2.44	0.63	3.11	0.16	0.79	0.08	0.71	0.08	0.08	0.08	2.92	0.75	3.66
104407	7-W	COMPOSITE	3.09	0.28	3.01	0.65	3.98	0.19	0.72	0.09	0.77	0.09	0.09	0.09	3.67	0.75	4.41

**INFORMATION
ONLY**

List Average



3.77

Signatures

OVERBURDEN PILE SAMPLING

Excavation Area: Reach 7

Date Sampled: 11/9/2010

PILE #: KC-R7-OB41

Est. Volume of Pile in Cubic Yards: 188

Number of Samples Required Per SOP 214:
5

Sample #	Total Radium in pCi/g (Th 232 + Ra 226)	QC Sample Dup. Tot. Rad. in pCi/g (Th 232 + Ra 226)	2 sigma uncertainty (Ra 226)	2 sigma uncertainty (Th 232)	S_d	S_{dup}
KC-R7-OB41-A	3.49					
KC-R7-OB41-B	3.69					
KC-R7-OB41-C	4.86					
KC-R7-OB41-D	4.37					
KC-R7-OB41-E	4.40					
KC-R7-OB41-F (QC-E)						
Average (Mean of the sample population) (\bar{X} bar)	5					
Average (Mean of the sample population) (\bar{X} bar)	4.16					

Number of Samples (n)

5

4.16

Average (Mean of the sample population) (\bar{X} bar)

$S_{dup} = \sqrt{S_1^2 + S_2^2} =$

0.58

AVERAGE OF SAMPLES IS < 7.2 pCi/g. PROCEED WITH CONFIDENCE LEVEL CHECK DESCRIBED IN SOP-214, PARAGRAPH 6.12	
Standard Deviation of Sample Population (S_d)	0.50
U_α (True Mean) = $(\bar{X} \text{ bar}) + (t^* (S_d / \sqrt{n}))$ Where t^* is a statistic used for small sample tests of hypotheses (the Student Distribution), from SOP No. KMS-102, Attachment 10.6	4.64
Release Criteria	7.20
SAMPLES TESTED MEET 95% CONFIDENCE LEVEL LIFT IS RADIOLOGICALLY ACCEPTABLE FOR USE AS ON SITE BACKFILL PER SOP-214	

$U_\alpha < \text{Release Criteria?}$

Michael F. Sauter / 11-11-10 Name/date

REVIEWED: SES/ARCADIS

Michael F. Sauter / 11-11-10 Name/date

APPROVED: OFFSITES MANAGER:

Chris Polk / 11-12-10 Name/date

Prepared by: ARCADIS
Date: 11/30/2010

Reach No.	Overburden Pile Sample No.	Date Sampled	Volume of Pile (cys.)	Date Resampled (if applicable)	Statistical Analysis Completed	Date of EPA Verification Email	Dates(s) When Backfilled	Areas(s) Used for Backfill within Reach 7	Comments
7	KC-R7-OB1	8/20/2010	540	NA	8/31/2010	9/23/2010	10/14 - 10/15/2010	Northern Portion of Area between the Islands	
7	KC-R7-OB2	8/24/2010	180	NA	8/31/2010	9/24/2010	"	West Side of Southern Main Channel	
7	KC-R7-OB3	8/27/2010	242	NA	9/2/2010	9/24/2010	"	"	
7	KC-R7-OB4	9/9/2010	242	NA	9/15/2010	9/24/2010	"	"	
7	KC-R7-OB5	9/10/2010	171	NA	9/15/2010	9/24/2010	"	"	
7	KC-R7-OB6	9/14/2010	170	NA	9/20/2010	9/24/2010	"	"	
7	KC-R7-OB7	9/14/2010	188	NA	9/20/2010	10/12/2010	"	"	
7	KC-R7-OB8	9/15/2010	130	NA	9/20/2010	10/12/2010	"	"	
7	KC-R7-OB9	9/15/2010	170	NA	9/22/2010	10/12/2010	"	"	
7	KC-R7-OB10	9/16/2010	*188	NA	9/22/2010	10/12/2010	"	"	
7	KC-R7-OB11	9/17/2010	170	NA	9/22/2010	10/25/2010	"	"	
7	KC-R7-OB12	9/21/2010	170	NA	9/25/2010	10/25/2010	"	"	
7	KC-R7-OB13	9/22/2010	188	NA	9/25/2010	10/25/2010	"	"	
7	KC-R7-OB14	9/24/2010	130	NA	9/28/2010	10/25/2010	"	"	
7	KC-R7-OB15	9/25/2010	188	NA	9/28/2010	10/25/2010	"	"	
7	KC-R7-OB16	9/27/2010	170	NA	9/29/2010	10/25/2010	"	"	
7	KC-R7-OB17	9/29/2010	130	NA	10/1/2010	10/25/2010	"	"	
7	KC-R7-OB18	10/6/2010	188	NA	10/12/2010	10/25/2010	"	"	
7	KC-R7-OB19	10/8/2010	170	NA	10/12/2010	10/25/2010	"	"	
7	KC-R7-OB20	10/11/2010	188	NA	10/13/2010	10/25/2010	"	"	
7	KC-R7-OB21	10/11/2010	340	NA	10/13/2010	11/13/2010	11/9 - from the south island	East side of main channel opposite R7-3 Northern Backwater Area	
7	KC-R7-OB22	10/12/2010	188	NA	10/15/2010	10/25/2010	"	"	
7	KC-R7-OB23	10/14/2010	130	NA	10/18/2010	10/25/2010	"	"	
7	KC-R7-OB24	10/28/2010	170	NA	11/3/2010	11/16/2010	"	"	
7	KC-R7-OB25	10/28/2010	188	NA	11/3/2010	11/16/2010	"	"	
7	KC-R7-OB26	10/29/2010	130	NA	11/3/2010	11/16/2010	"	"	
7	KC-R7-OB27	11/1/2010	170	NA	11/5/2010	11/16/2010	"	"	
7	KC-R7-OB28	11/2/2010	188	NA	11/5/2010	11/16/2010	"	"	
7	KC-R7-OB29	11/2/2010	130	NA	11/5/2010	11/16/2010	"	"	
7	KC-R7-OB30	11/3/2010	188	NA	11/5/2010	11/16/2010	"	"	
7	KC-R7-OB31	11/3/2010	170	NA	11/8/2010	11/19/2010	"	"	
7	KC-R7-OB32	11/4/2010	188	NA	11/8/2010	11/19/2010	"	"	
7	KC-R7-OB33	11/4/2010	130	NA	11/8/2010	11/19/2010	"	"	
7	KC-R7-OB34	11/5/2010	188	NA	11/9/2010	11/30/2010	"	"	
7	KC-R7-OB35	11/5/2010	170	NA	11/9/2010	11/30/2010	"	"	
7	KC-R7-OB36	11/5/2010	130	NA	11/9/2010	11/30/2010	"	"	
7	KC-R7-OB37	11/6/2010	188	NA	11/11/2010	11/30/2010	"	"	
7	KC-R7-OB38	11/8/2010	170	NA	11/11/2010	11/30/2010	"	"	
7	KC-R7-OB39	11/8/2010	188	NA	11/11/2010	11/30/2010	"	"	
7	KC-R7-OB40	11/8/2010	130	NA	11/11/2010	11/30/2010	"	"	
7	KC-R7-OB41	11/9/2010	188	NA	11/12/2010	11/30/2010	"	"	

Total Overburden to Date (cys.) 7387 (Not including OB10)



Appendix H

Imported Material Sampling Data (on attached CD)

(Note: The referenced ARCADIS transmittals KC-122 and KC-128 in these Appendix H documents were previously presented in the Reaches 5E and 6 Final Completion Report and therefore are not included in this appendix.)

Transmittal Letter

To:
 Rick Copeland, Project Manager
 West Chicago Environmental Response Trust
 800 Weyrauch Street
 West Chicago, IL 60185

Copies:
 Heather VanDewalker, ARCADIS
 Marty Folan, Sevenson

ARCADIS
 800 Weyrauch Street
 West Chicago
 Illinois 60185
 Tel 630.293.7695, Ext. 11
 Fax 630.293.7719

KC 208

From:
 Michael Savage *Michael F. Savage*
 Subject:
 Kress Creek/West Branch Remedial Action
 Project – Reach 7

Date:
 August 19, 2011

ARCADIS Project No.:
 B0071034.0000

We are sending you:

- | | | | |
|--|--|---|---------------------------------------|
| <input checked="" type="checkbox"/> Attached | <input type="checkbox"/> Under Separate Cover Via _____ the Following Items: | | |
| <input type="checkbox"/> Shop Drawings | <input type="checkbox"/> Plans | <input type="checkbox"/> Specifications | <input type="checkbox"/> Change Order |
| <input type="checkbox"/> Prints | <input type="checkbox"/> Samples | <input type="checkbox"/> Copy of Letter | <input type="checkbox"/> Reports |
| <input checked="" type="checkbox"/> Other: Required Submittals | | | |

Copies	Date	Drawing No.	Rev.	Description	Action*
1	08/16/2011	SES Trans. 057		Summary tables and truck tickets for imported materials used during the Reach 7 2010 construction season	FA

Action*

- | | | |
|---|---|--|
| <input type="checkbox"/> A Approved | <input type="checkbox"/> CR Correct and Resubmit | <input type="checkbox"/> Resubmit _____ Copies |
| <input type="checkbox"/> AN Approved As Noted | <input type="checkbox"/> F File | <input type="checkbox"/> Return _____ Copies |
| <input type="checkbox"/> AS As Requested | <input checked="" type="checkbox"/> FA For Approval | <input type="checkbox"/> Review and Comment |
| <input type="checkbox"/> Other: _____ | | |

Mailing Method

- | | | | |
|--|---|---|---|
| <input type="checkbox"/> U.S. Postal Service 1 st Class | <input checked="" type="checkbox"/> Courier/Hand Delivery | <input type="checkbox"/> FedEx Priority Overnight | <input type="checkbox"/> FedEx 2-Day Delivery |
| <input type="checkbox"/> Certified/Registered Mail | <input type="checkbox"/> United Parcel Service (UPS) | <input type="checkbox"/> FedEx Standard Overnight | <input type="checkbox"/> FedEx Economy |
| <input type="checkbox"/> Other: _____ | | | |

Comments: Attachments: Four packets of truck tickets



SEVENSON ENVIRONMENTAL SERVICES, INC.
2749 LOCKPORT RD.
NIAGARA FALLS, NY 14305
(716) 284-0431 Fax (716) 284-7645

Kress Creek Remedial Action
West Chicago, IL

To: Mike Savage
ARCADIS

LETTER OF TRANSMITTAL
Date: 8/16/2011
Transmittal No.: 057
Job Number: B0071034.0000
RE: 2010 Fill Submittals

We Are Sending the Following:

- Attached
 Under Separate Cover Via

- Specifications
 Certificates Of Compliance
 Manufacturer Instructions
 O&M Manuals and Data
 Electronic Copy

- Prints
 Drawings
 Subcontract
 Copy of Letter
 Records

- Work Plans
 Samples
 Report
 Submittals
 Other: _____

Copies	Date	Spec. Number	Description
1	2010	Doc. 300, Rev. 3, Section 02200	Backfill Material Source
1	2010	Doc. 300, Rev. 3, Section 02200	Summary Tables and tickets of imported materials used during the 2010 construction season.

These are Transmitted as Checked Below:

- For Approval
 For Your Use
 As Requested
 For Review and Comment

- Approved as Submitted
 Approved as Noted
 Returned for Corrections
 Issued for Construction

- Resubmit ___ Copies for Approval
 Submit ___ Copies for Distribution
 Return ___ Corrected Prints
 Preliminary/Reference Only
 Prints Returned After Loan
 Other _____

For Bids Due: _____

Remarks:

Any Questions or comments please call Martin Folan or myself at 630-293-7926.

Copy To: _____ Sent By: Amy Ruta
Received By: _____

Submittals section 2200.1.6.1

	Vendor	Material	Location	Material Location	Phone
1	Arthur J. Lootens & Son, Inc.	CA-06 Stone Topsoil	0 South 551 Joliet Road, West Chicago, IL 60185	Same as Location	630-231-1487
2	Boughton Trucking and Material, Inc.	River Rock	11746 South Naperville-Plainfield Road, Plainfield, IL 60544	Same as Location	
3	Lafarge	CA-06 Stone	P.O. Box 370, Elburn, IL 60119	Elburn Plant	815-436-4555
		CA-06 Stone		Elburn Plant	630-365-3600
		FA-02 Sand		Elburn Plant	
		Stone Screenings		Elburn Plant	
		3" Stone		Elburn Plant	
4	Western Lime	Calcium Lime	206 North 6th Avenue, West Bend, WI 53905	Same as Location	262-334-3005

Backfill - 2010 Construction Season

Date	Location/Purpose	Delivered By	Loads	Tons	Total Tons	CY	Total CY
6/29/2010	R7 Butterfield/Restoration	Lootens	15	300	300	225	225
7/2/2010	R7 Butterfield/Restoration	Lootens	9	180	480	135	360
7/22/2010	R7 Butterfield/Restoration	Lootens	26	520	1,000	390	750
8/13/2010	R7 Butterfield/Restoration	Lootens	17	340	1,340	255	1,005
8/19/2010	R7 Butterfield/Restoration	Lootens	39	780	2,120	585	1,590
8/20/2010	R7 Butterfield/Restoration	Lootens	41	820	2,940	615	2,205
9/30/2010	R7 Butterfield/Restoration	Lootens	54	1,080	4,020	745	2,950
10/1/2010	R7 Butterfield/Restoration	Lootens	65	1,300	5,320	840	3,790

This material was imported from the DuPage County Forest Preserve and is exempt from backfill testing.

Calcium Lime - 2010 Construction Season

Date	Location/Purpose	Delivered By	Loads	Tons	Total Tons
8/13/2010	R7	Western Lime	1	26.20	26
8/19/2010	R7	Western Lime	2	53.47	80
8/24/2010	R7	Western Lime	1	26.69	106
8/25/2010	R7	Western Lime	1	26.95	133
8/26/2010	R7	Western Lime	1	27.07	160
8/27/2010	R7	Western Lime	2	80.14	241
8/28/2010	R7	Western Lime	1	25.17	266
8/30/2010	R7	Western Lime	1	26.87	293
8/31/2010	R7	Western Lime	1	25.32	318
9/1/2010	R7	Western Lime	2	50.29	368
9/7/2010	R7	Western Lime	1	25.67	394
9/8/2010	R7	Western Lime	2	50.27	444
9/9/2010	R7	Western Lime	3	72.88	517
9/10/2010	R7	Western Lime	3	71.67	589
9/11/2010	R7	Western Lime	2	50.11	639
9/13/2010	R7	Western Lime	1	25.33	664
9/14/2010	R7	Western Lime	2	48.00	712
9/15/2010	R7	Western Lime	3	70.23	782
9/16/2010	R7	Western Lime	3	71.99	854
9/17/2010	R7	Western Lime	3	71.80	926
9/18/2010	R7	Western Lime	2	50.27	976
9/20/2010	R7	Western Lime	3	71.23	1048
9/21/2010	R7	Western Lime	3	73.39	1121
9/22/2010	R7	Western Lime	3	73.09	1194
9/23/2010	R7	Western Lime	3	74.17	1268
9/24/2010	R7	Western Lime	3	72.18	1340
9/25/2010	R7	Western Lime	3	71.89	1412
9/27/2010	R7	Western Lime	2	50.91	1463
9/29/2010	R7	Western Lime	5	120.88	1584
9/30/2010	R7	Western Lime	8	193.19	1777
10/1/2010	R7	Western Lime	6	143.33	1921
10/2/2010	R7	Western Lime	5	126.05	2047
10/5/2010	R7	Western Lime	5	122.95	2170
10/6/2010	R7	Western Lime	5	124.52	2294
10/7/2010	R7	Western Lime	6	150.48	2445
10/8/2010	R7	Western Lime	5	116.60	2561
10/9/2010	R7	Western Lime	6	150.12	2711
10/11/2010	R7	Western Lime	5	121.97	2833
10/12/2010	R7	Western Lime	8	197.96	3031
10/13/2010	R7	Western Lime	6	151.72	3183

Calcium Lime - 2010 Construction Season

Date	Location/Purpose	Delivered By	Loads	Tons	Total Tons
10/14/2010	R7	Western Lime	5	124.92	3308
10/16/2010	R7	Western Lime	2	51.07	3359
10/29/2010	R7	Western Lime	5	126.27	3485
10/30/2010	R7	Western Lime	4	102.15	3587
11/1/2010	R7	Western Lime	5	125.22	3713
11/2/2010	R7	Western Lime	4	101.65	3814
11/3/2010	R7	Western Lime	2	50.73	3865
11/5/2010	R7	Western Lime	4	98.74	3964
11/6/2010	R7	Western Lime	6	151.89	4116
11/8/2010	R7	Western Lime	5	124.55	4240
11/9/2010	R7	Western Lime	5	126.89	4367
11/16/2010	R7	Western Lime	5	128.08	4495
11/18/2010	R7	Western Lime	2	48.88	4544
11/30/2010	R7	Western Lime	3	75.59	4620
12/1/2010	R7	Western Lime	3	75.38	4695
12/2/2010	R7	Western Lime	3	75.71	4771
12/3/2010	R7	Western Lime	2	51.16	4822

CA-6 Stone - 2010 Construction Season

Date	Location/Purpose	Delivered By	Loads	Tons	Total Tons	CY	Total CY
6/11/2010	R7 Butterfield/Haul Rd	Lafarge	24	506.70	507	288	288
6/17/2010	R7 Butterfield/Haul Rd	Lafarge	3	65.57	572	36	324
6/18/2010	R7 Butterfield/Haul Rd	Lafarge	39	829.57	1,402	468	792
6/21/2010	R7 Butterfield/Haul Rd	Lafarge	10	200.25	1,602	120	912
6/22/2010	R7 Butterfield/Haul Rd	Lafarge	50	1118.92	2,721	600	1,512
6/23/2010	R7 Butterfield/Haul Rd	Lootens	5	70.00	2,791	60	1,572
6/24/2010	R7 Butterfield/Haul Rd	Lootens	3	42.00	2,833	36	1,608
6/25/2010	R7 Butterfield/Haul Rd	Lafarge	37	779.57	3,613	444	2,052
7/28/2010	R7 Butterfield/Haul Rd	Boughton	1	19.40	3,632	12	2,064
8/25/2010	R7 Butterfield/Haul Rd	Lootens	1	20.00	3,652	12	2,076
8/28/2010	R7 Butterfield/Haul Rd	Lootens	2	40.00	3,692	24	2,100

FA-2 Sand - 2010 Construction Season

Date	Location/Purpose	Delivered By	Loads	Tons	Total Tons	CY	Total CY
6/21/2010	R7 Butterfield	Lafarge	1	12.06	12	12	12
8/10/2010	R7 Butterfield	Lafarge	1	19.91	32	12	24
8/17/2010	REF	Lafarge	1	13.77	46	12	36
9/10/2010	R7 Butterfield	Lafarge	1	22.18	68	12	48

Lootens Pulverized & Topsoil - 2010 Construction Season

Date	Location	Delivered By	Loads	Tons	Total Tons	CY	Total CY	Decline Balance
10/21/2010	R5C	Lootens	1	15	15	10	10	6531
10/25/2010	R5D	Lootens	1	12	27	8	18	6523

The required testing for this material corresponds to ARCADIS Transmittal KC122.

Lootens River Rock - 2010 Construction Season

Date	Location/Purpose	Delivered By	Loads	Tons	Total Tons	CY	Total CY	Decline Balance
7/30/2010	Energy dissipation	Lootens	2	40	40	24	24	1,358
8/12/2010	R7/Central sump	Lootens	1	20	20	15	15	1,343
8/13/2010	R7/Central sump	Lootens	1	20	40	15	30	1,328
9/21/2010	Restoration	Lootens	2	40	80	24	54	1,304
9/30/2010	Restoration	Lootens	3	60	140	36	90	1,268
10/1/2010	Restoration	Lootens	3	60	200	36	126	1,232

The required testing for this material corresponds to ARCADIS Transmittal KC128.

Hydric Soil - 2010 Construction Season

Date	Location	Delivered By	Loads	Tons	Total Tons	CY	Total CY
7/7/2010	Mack Road to Butterfield	Lootens	30	600	600	450	450
7/8/2010	Mack Road to Butterfield	Lootens	15	300	900	225	675

This material was imported from the DuPage County Forest Preserve and is exempt from backfill testing.

Mixed Fill - 2010 Construction Season

Date	Location/Purpose	Delivered By	Loads	Tons	Total Tons	CY	Total CY
8/25/2010	R7 Main Channel	Lootens	39	780	780	585	585
8/26/2010	R7 Main Channel	Lootens	42	840	1,620	630	1,215
8/28/2010	R7 Main Channel	Lootens	63	1,260	2,880	945	2,160
9/8/2010	R7 Main Channel	Lootens	26	520	3,400	369	2,529
9/10/2010	R7 Main Channel	Lootens	11	220	3,620	135	2,664
9/13/2010	R7 Main Channel	Lootens	79	1,580	5,200	1,100	3,764
9/14/2010	R7 Main Channel	Lootens	72	1,440	6,640	1,080	4,844
9/17/2010	R7 Main Channel	Lootens	65	1,300	7,940	910	5,754
9/27/2010	R7 Main Channel	Lootens	48	960	8,900	640	6,394
9/28/2010	R7 Main Channel	Lootens	53	1,060	9,960	680	7,074
9/29/2010	R7 Main Channel	Lootens	53	1,060	11,020	755	7,829
9/30/2010	R7 Main Channel	Lootens	12	240	11,260	120	7,949

This material was imported from the DuPage County Forest Preserve and is exempt from backfill testing.

Stone Screenings - 2010 Construction Season

Date	Location/Purpose	Delivered By	Loads	Tons	Total Tons	CY	Total CY
6/21/2010	Butterfield Road/Restoration	Lafarge	1	11.44	11	10	10

3" Stone - 2010 Construction Season

Date	Location/Purpose	Delivered By	Loads	Tons	Total Tons	CY	Total CY
6/18/2010	R7 Butterfield	Lafarge	14	295.94	296	210	210



Appendix I

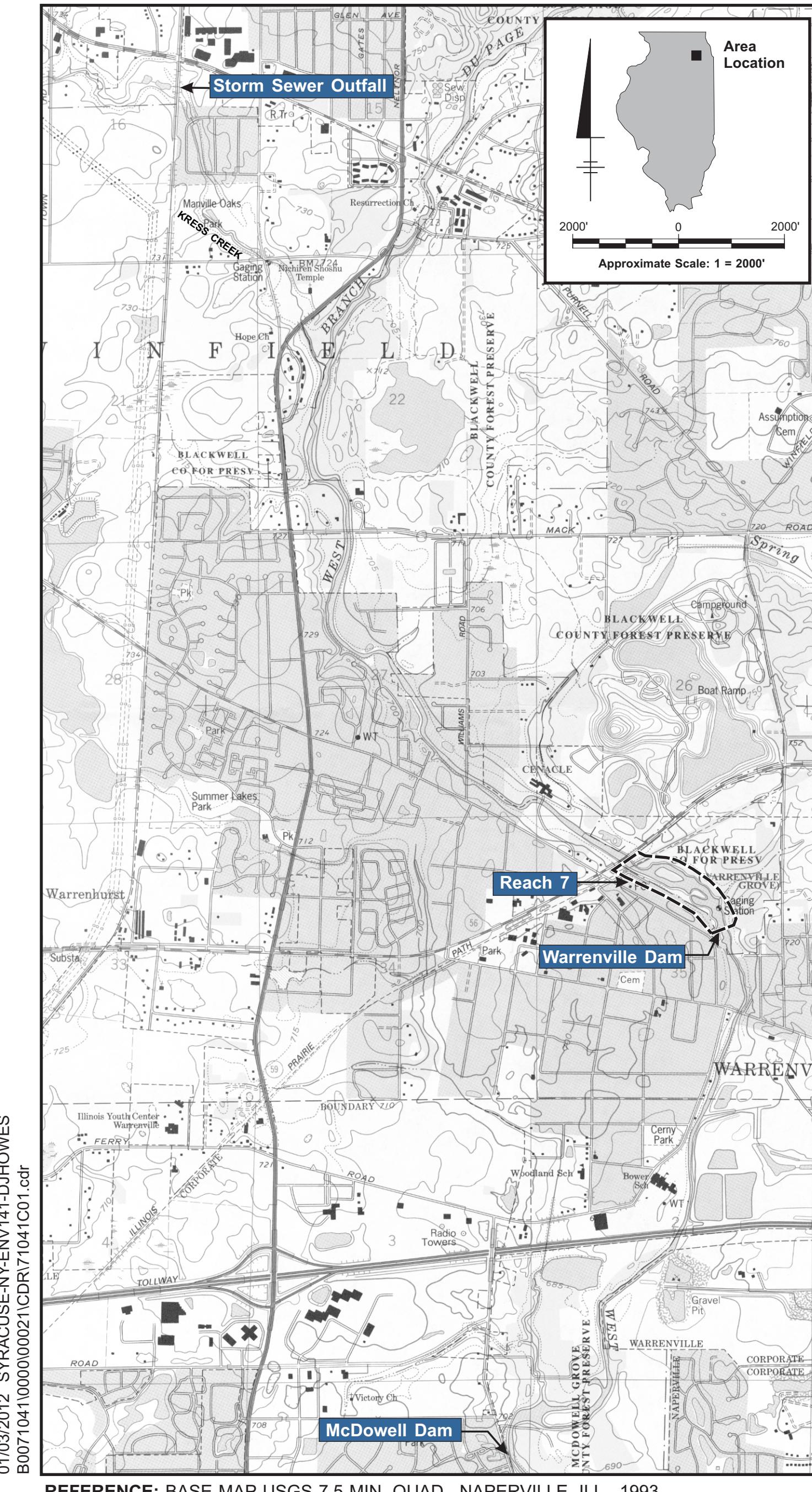
Record Drawings

RECORD DRAWINGS

REMEDIAL ACTION FOR REACH 7

KRESS CREEK/WEST BRANCH

DuPAGE RIVER SITE



DuPAGE COUNTY, IL

FEBRUARY 2012

WEST CHICAGO
ENVIRONMENTAL RESPONSE TRUST

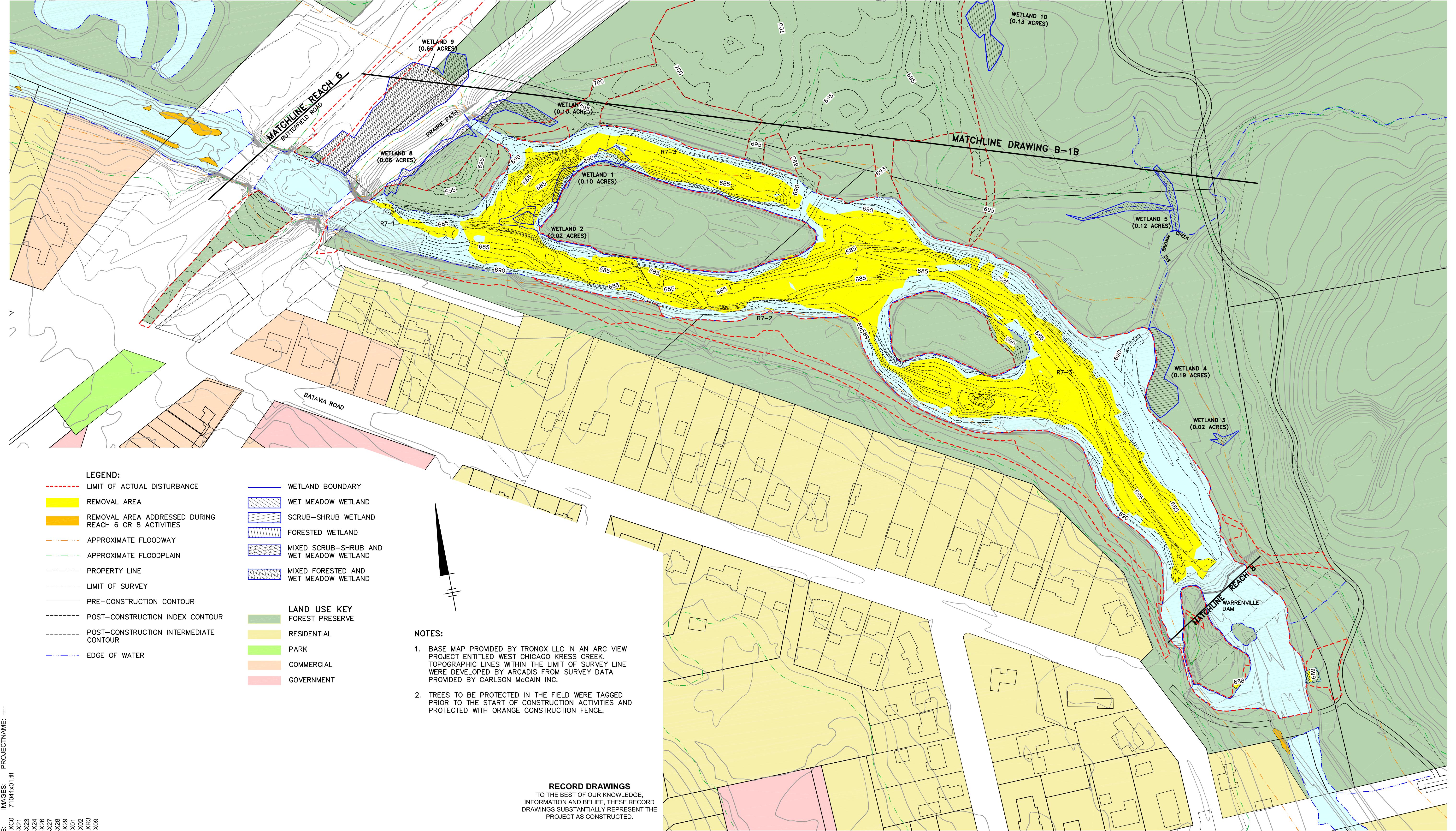
RECORD DRAWINGS

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INFORMATION AND BELIEF, THESE RECORD
DRAWINGS SUBSTANTIALLY REPRESENT
THE PROJECT AS CONSTRUCTED

DATE _____ BY _____

INDEX OF DRAWINGS

- A-1 TITLE SHEET
- B-1A SITE PLAN WITH EXISTING CONDITIONS
- B-1B SITE PLAN WITH EXISTING CONDITIONS
- B-3 TRANSECT LOCATIONS AND EXISTING CHANNEL PLAN AND PROFILE
- B-6 TYPICAL BANK RESTORATION DETAILS
- B-7A REACH 7 VEGETATION RESTORATION PLAN
- B-7B STAGING AREA AND ACCESS ROAD VEGETATION RESTORATION PLAN
- B-8 VEGETATION SPECIFICATION SUMMARY TABLES



DATE _____ BY _____

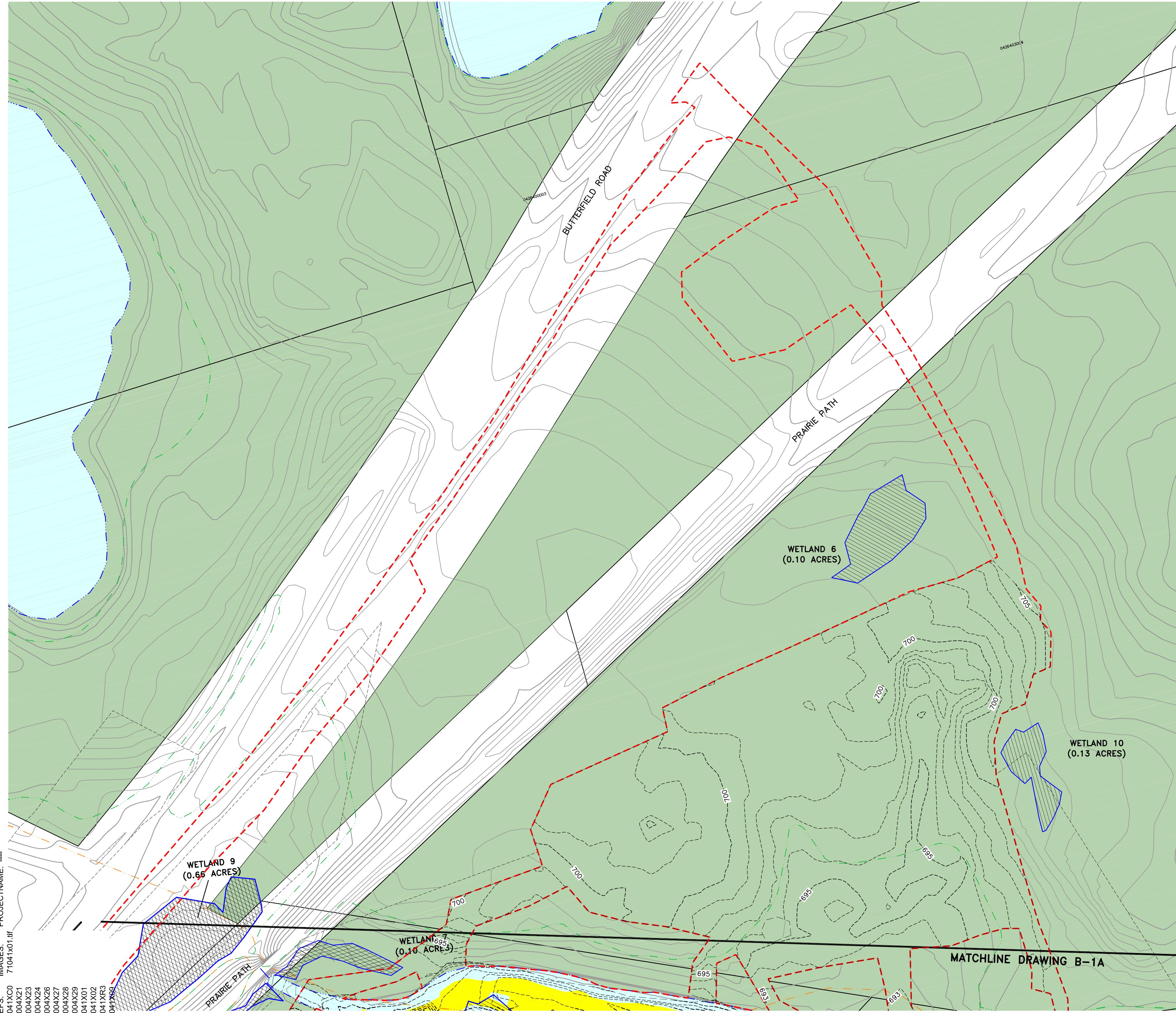
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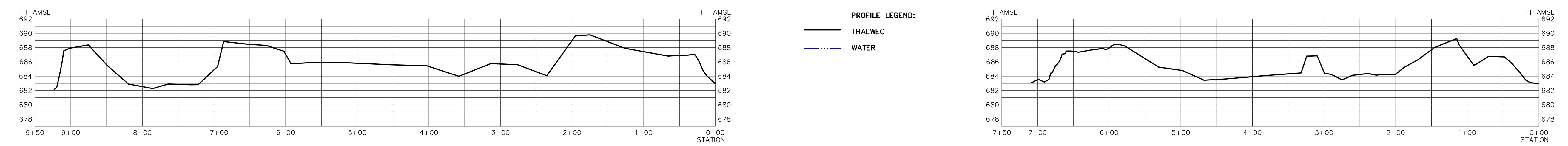
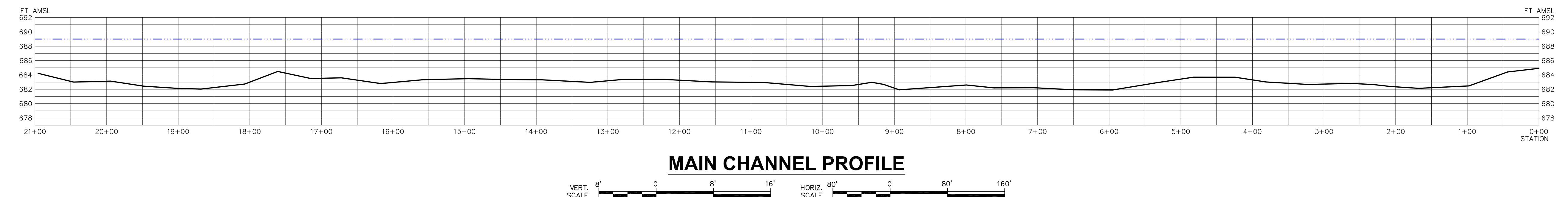
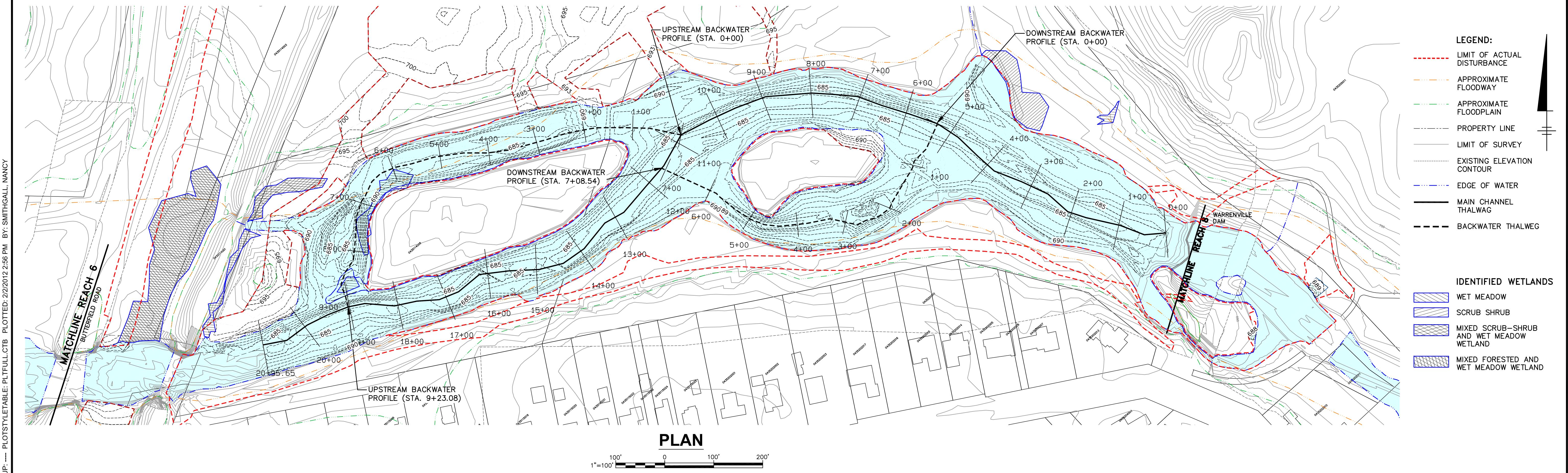
TRONOX LLC • KRESS CREEK/WEST BRANCH DuPAGE RIVER SITE
RECORD DRAWING - REACH 7

ARCADIS
ARCADIS U.S., INC.

DRAFT

B-1A





XREFS: PROJECTNAME: ---
IMAGES: 71041x01.tif
XREFS: 71004X27 71004X21 71004X23 71004X29 71004X26 71004X24 71041X01 71041XR3 71041X09 71041X02

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:
[Scale Bar]
USE TO VERIFY REPRODUCTION SCALE

2/3/12 RECORD DRAWING
No. Date Revisions
EAR MFS By Ckd
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Professional Engineer's Name
MARK OWEN GRAVELDING
Professional Engineer No.
062059378
State Date Signed Project Mgr.
ILLINOIS MOG
Designed by Drawn by Checked by
ANE NES EAR

DRAFT

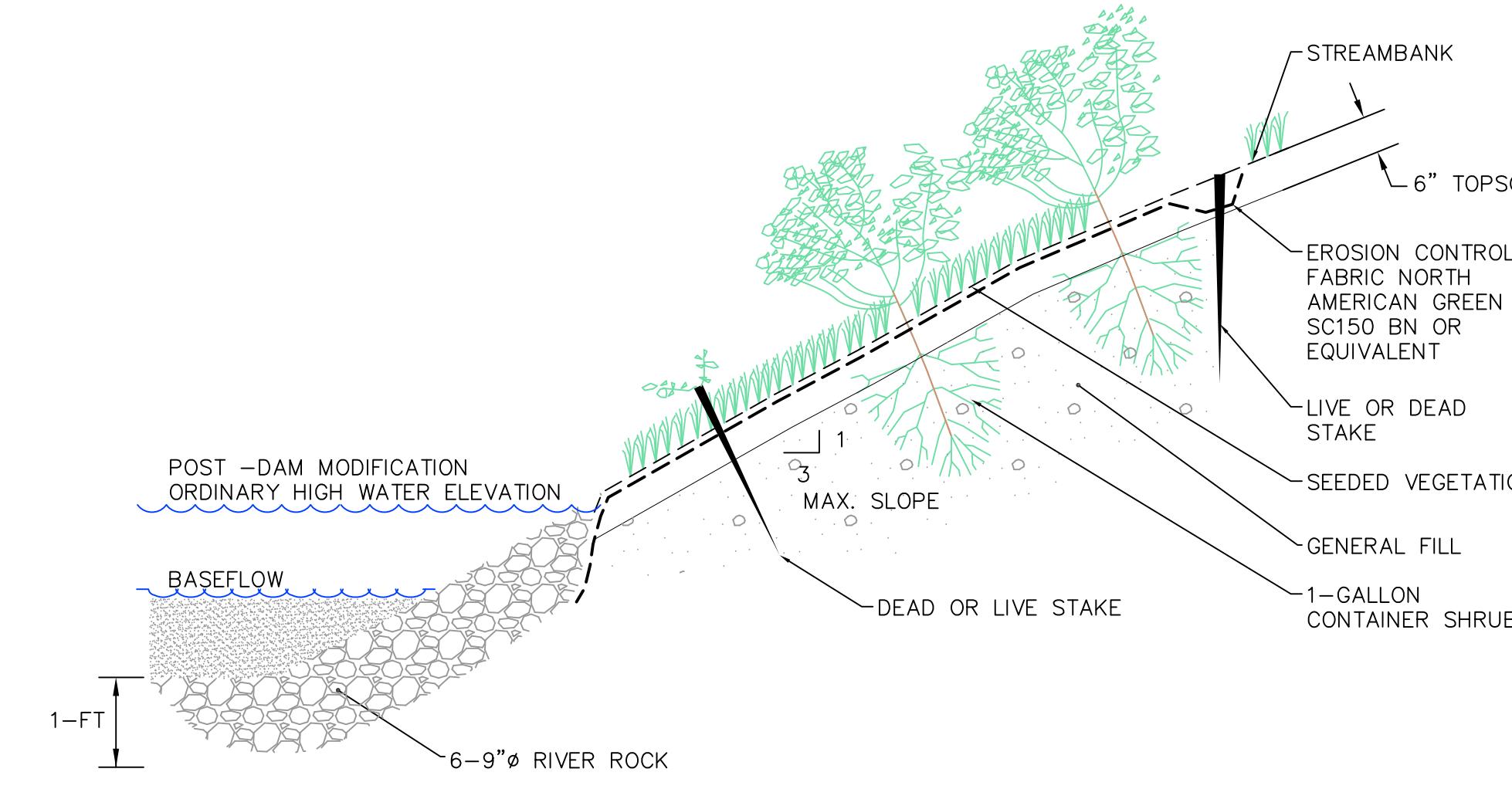


TRONOX LLC • KRESS CREEK/WEST BRANCH DuPAGE RIVER SITE
RECORD DRAWING - REACH 7

TRANSECT LOCATIONS AND EXISTING CHANNEL PLAN AND PROFILE

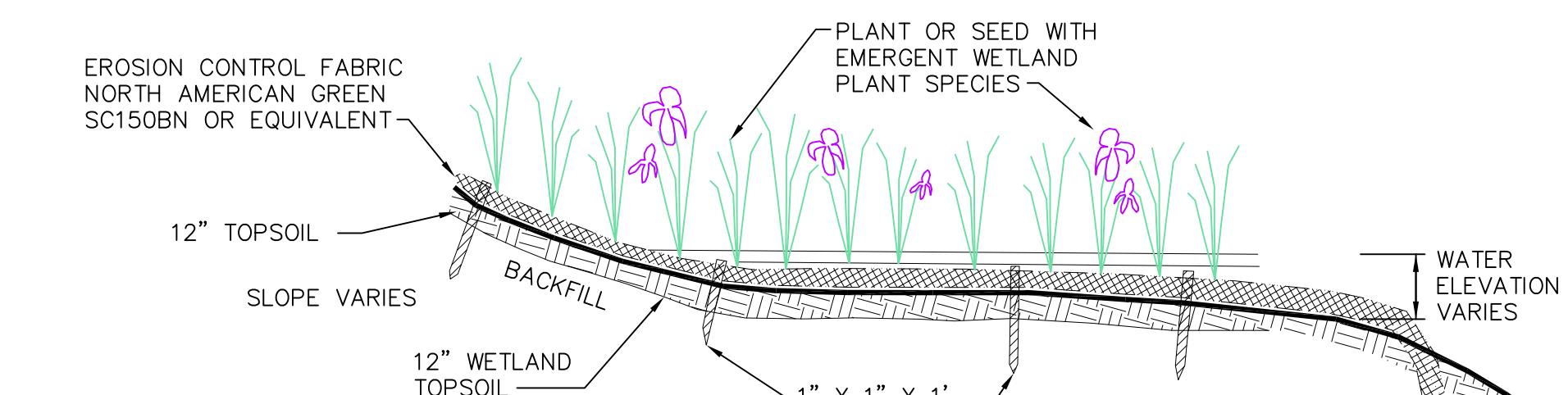
ARCADIS Project No.
B0071041.0000
Date
FEBRUARY 2012
ARCADIS
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

B-3



**CROSS SECTION A - TYPICAL LOW VELOCITY
SHRUB-VEGETATED BANK WITH ARMOR TO ORDINARY HIGH
WATER ELEVATION RESTORATION DETAIL**

NOT TO SCALE

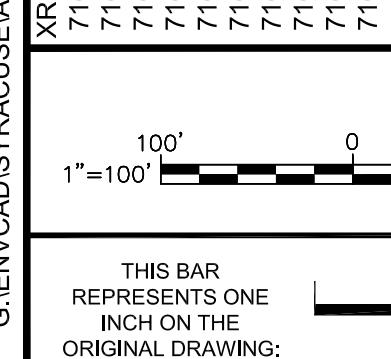
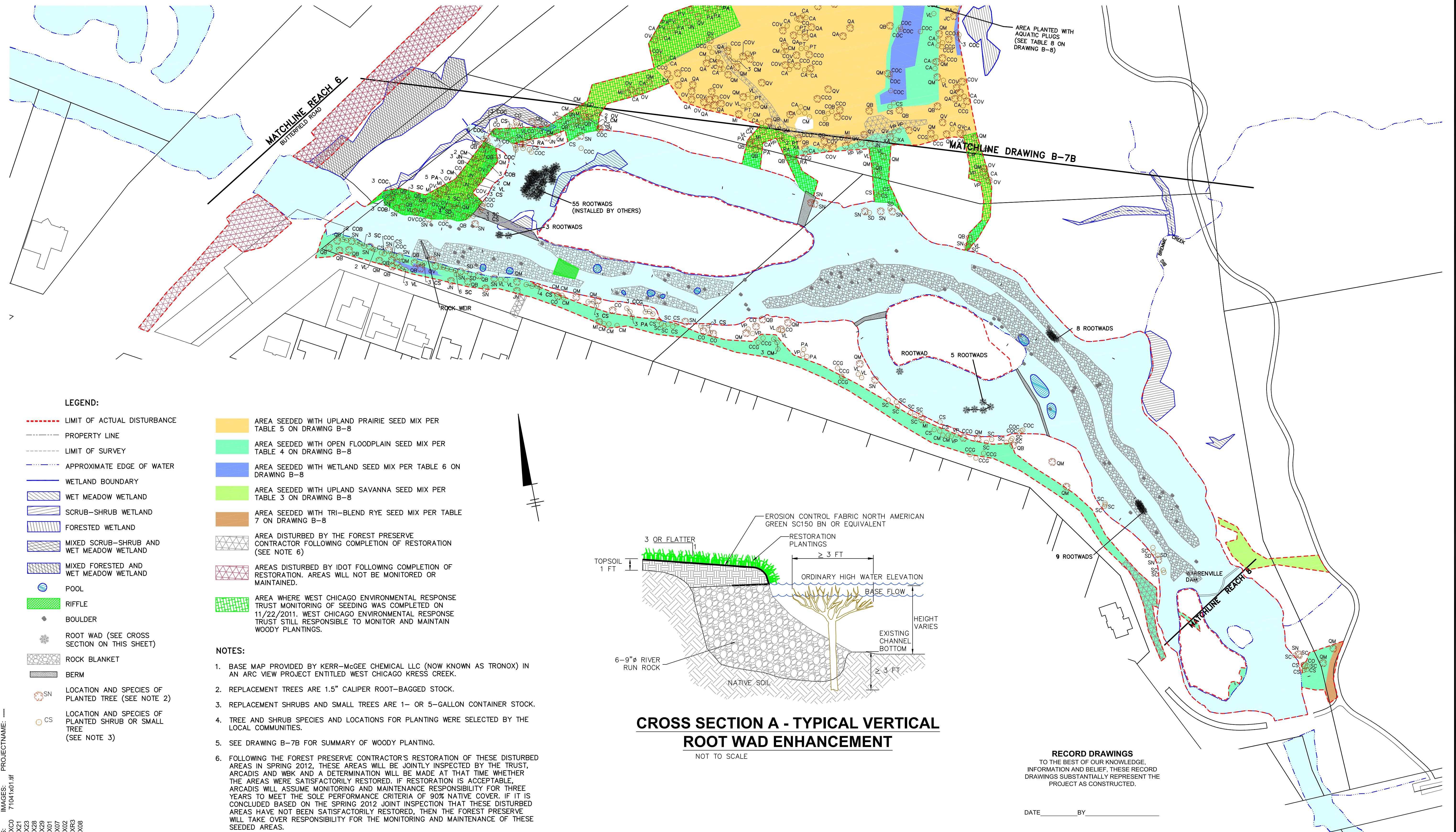


**CROSS SECTION B - TYPICAL EMERGENT
WETLAND BANK RESTORATION DETAIL**

NOT TO SCALE

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TRONOX LLC • KRESS CREEK/WEST BRANCH DuPAGE RIVER SITE RECORD DRAWING - REACH 7												B-6	
TYPICAL BANK RESTORATION DETAILS													
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:	USE TO VERIFY REPRODUCTION SCALE	▲ 2/3/12	RECORD DRAWING	EAR	MFS	Professional Engineer's Name MARK OWEN GRAVELDING	State ILLINOIS	Date Signed	Project Mgr. MOG	DRAFT	ARCADIS U.S., INC.		
		No.	Date	Revisions	By Ckd	Professional Engineer's No. 062059378						ARCADIS Project No. B0071041.0000	
THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.						Designed by ANE	Drawn by NES	Checked by EAR				Date FEBRUARY 2012	
												ARCADIS 6723 Towpath Road Syracuse, NY 13214 315-446-9120	



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No.	Date	Revisions	By	Ckd

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Professional Engineer's Name MARK OWEN GRAVELDING		
Professional Engineer's No. 062059378		
State ILLINOIS	Date Signed	Project Mgr. MOG
Designed by ANE	Drawn by NES	Checked by EAR

DRAFT

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ARCADIS U.S., INC.

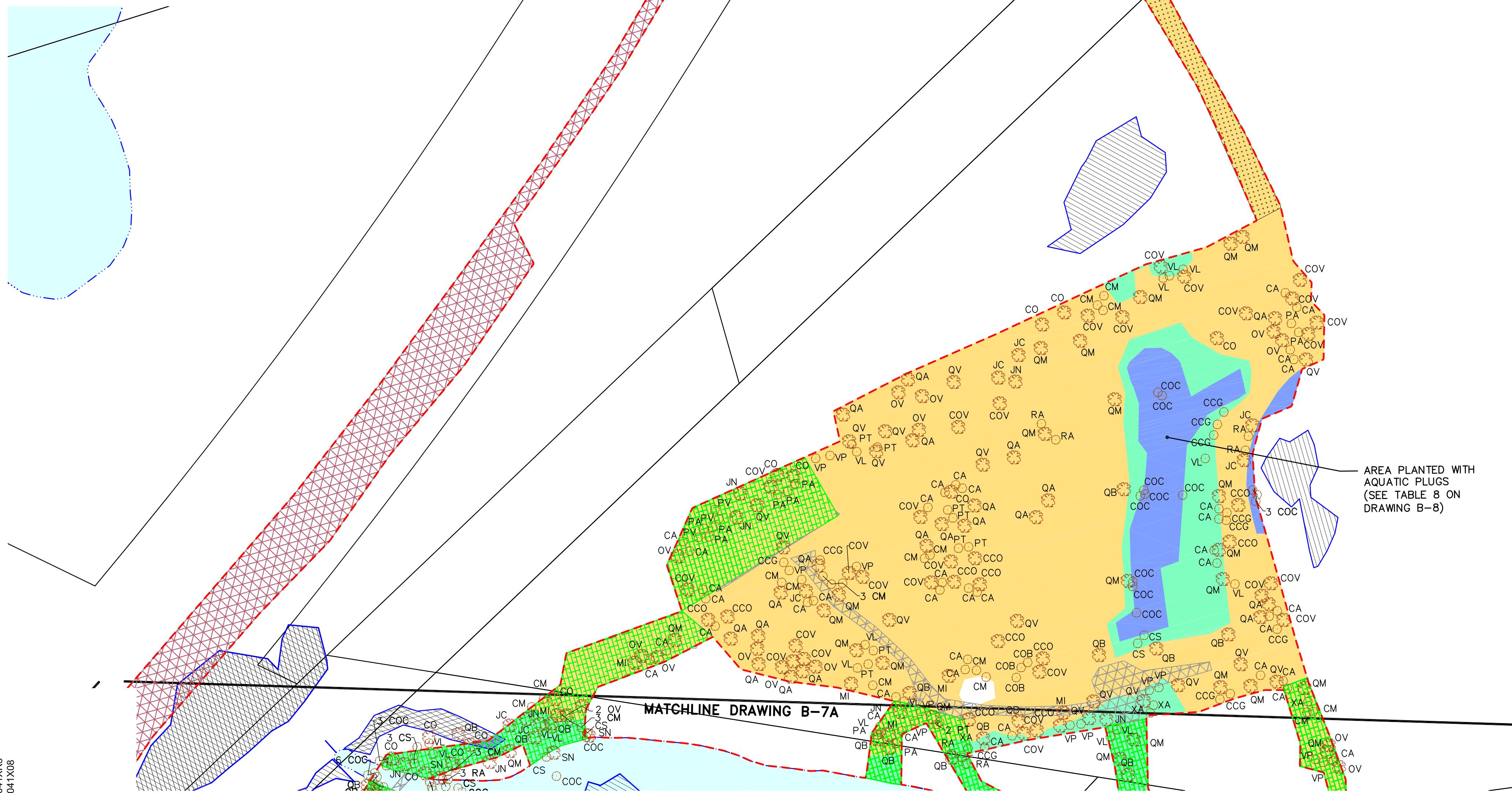
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RECORD DRAWING - REACH 7
REACH 7 VEGETATION RESTORATION PLAN

ARCADIS Project No. B0071041.0000	B-7A
Date FEBRUARY 2012	
ARCADIS 6723 Towpath Road Syracuse, NY 13214 315-446-9120	

Summary of Woody Plantings				
Scientific Name	Sym.	Common Name	Number	Planted
			Shrubs	Trees
<i>Corylus americana</i>	CA	American Hazelnut	38	
<i>Crataegus crus-galli</i>	CCG	Cockspur Hawthorn	22	
<i>Carya cordiformis</i>	CCO	Bitternut Hickory		12
<i>Crataegus mollis</i>	CM	Downy Hawthorn	41	
<i>Celtis occidentalis</i>	CO	Hackberry		22
<i>Cornus obliqua</i>	COB	Silky Dogwood	11	
<i>Cephalanthus occidentalis</i>	COC	Buttonbush	38	
<i>Carya ovata</i>	COV	Shagbark Hickory		28
<i>Cornus stolonifera</i>	CS	Red Osier Dogwood	41	
<i>Juglans cinerea</i>	JC	Butternut		7
<i>Juglans nigra</i>	JN	Black Walnut		15
<i>Malus ioensis</i>	MI	Iowa Crab Apple		10
<i>Ostrya virginiana</i>	OV	American Hophornbeam/Ironwood		22
<i>Prunus americana</i>	PA	Wild Plum	20	
<i>Ptelea trifoliata</i>	PT	Wafer Ash	10	
<i>Prunus virginiana</i>	PV	Choke Cherry	3	
<i>Quercus alba</i>	QA	White Oak		20
<i>Quercus bicolor</i>	QB	Swamp White Oak		36
<i>Quercus macrocarpa</i>	QM	Bur Oak		40
<i>Quercus velutina</i>	QV	Black Oak		16
<i>Ribes americanum</i>	RA	Wild Black Currant	9	
<i>Sambucus canadensis</i>	SC	Common Elderberry	42	
<i>Salix discolor</i>	SD	Pussy Willow	10	
<i>Salix nigra</i>	SN	Black Willow		25
<i>Viburnum lentago</i>	VL	Nannyberry	32	
<i>Viburnum prunifolium</i>	VP	Blackhaw	17	
<i>Xanthoxylum americanum</i>	XA	Prickly Ash	4	
Totals			338	253

TB PLOTTED: 2/2/2012 2:50 PM BY: SMITHGALL, NANCY

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: LYR:ON=*,OFF=*REF*
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TRONOX LLC • KRESS CREEK/WEST BRANCH DuPAGE RIVER SITE
RECORD DRAWING - REACH 7

STAGING AREA AND ACCESS ROAD VEGETATION RESTORATION PLAN

AFT **AM ARCADIS**

ARCADIS U.S., INC.

DIV/GROUP:
CITY: G:\ENVCAD\SYRACUS

1" = 80'

80' 0

THIS BAR
REPRESENTS ONE
INCH ON THE

80' 160'

RECORD DRAWING
Revisions
THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE

	Professional Engineer's Name MARK OWEN GRAV		
	Professional Engineer's No. 062059378		
AR	MFS	State ILLINOIS	Date Signed P M
By	Ckd	Designed by OCK	Drawn by C

LDING		
ect Mgr.	DRAFT	
G		
cked by		

ARCADIS

LEGEND:	
-----	LIMIT OF ACTUAL DISTURBANCE
-----	PROPERTY LINE
-----	LIMIT OF SURVEY
-----	APPROXIMATE EDGE OF WATER
_____	WETLAND BOUNDARY
	WET MEADOW WETLAND
	FORESTED WETLAND
	MIXED SCRUB SHRUB/WET MEADOW WETLAND
	MIXED FORESTED/WET MEADOW WETLAND
	AREA SEEDED WITH UPLAND PRAIRIE SEED MIX PER TABLE 5 ON DRAWING B-8
	AREA SEEDED WITH OPEN FLOODPLAIN SEED MIX PER TABLE 4 ON DRAWING B-8
	AREA SEEDED WITH WETLAND SEED MIX PER TABLE 6 ON DRAWING B-8
	AREA TO BE SEEDED AND PLANTED WITH THE REQUIRED REPLACEMENT TREES AND SHRUBS ONCE THE STONE ACCESS ROAD AND PARKING LOT ARE REMOVED, AND ONCE THE AREA HAS BEEN FINAL GRADED WITH TOPSOIL.
	AREA DISTURBED BY THE FOREST PRESERVE CONTRACTOR FOLLOWING COMPLETION OF RESTORATION. (SEE NOTE 5)
	AREAS DISTURBED BY IDOT FOLLOWING COMPLETION OF RESTORATION. AREAS WILL NOT BE MONITORED OR MAINTAINED.
	AREA WHERE WEST CHICAGO ENVIRONMENTAL RESPONSE TRUST MONITORING OF SEEDING WAS COMPLETED ON 11/22/2011. WEST CHICAGO ENVIRONMENTAL RESPONSE TRUST STILL RESPONSIBLE TO MONITOR AND MAINTAIN WOODY PLANTINGS.
 SN	LOCATION AND SPECIES OF PLANTED TREE (SEE NOTE 2)
 CS	LOCATION AND SPECIES OF PLANTED SHRUB OR SMALL TREE (SEE NOTE 3)

NOTES

1. BASE MAP PROVIDED BY KERR-MCGEE CHEMICAL LLC (NOW KNOWN AS TRONOX) IN AN ARC VIEW PROJECT ENTITLED WEST CHICAGO KRESS CREEK.
 2. REPLACEMENT TREES ARE 1.5" CALIPER ROOT-BAGGED STOCK.
 3. REPLACEMENT SHRUBS AND SMALL TREES ARE 1- OR 5-GALLON CONTAINER STOCK.
 4. TREE AND SHRUB SPECIES AND LOCATIONS FOR PLANTING WERE SELECTED BY THE LOCAL COMMUNITIES.
 5. FOLLOWING THE FOREST PRESERVE CONTRACTOR'S RESTORATION OF THESE DISTURBED AREAS IN SPRING 2012, THESE AREAS WILL BE JOINTLY INSPECTED BY THE TRUST, ARCADIS AND WBK AND A DETERMINATION WILL BE MADE AT THAT TIME WHETHER THE AREAS WERE SATISFACTORILY RESTORED. IF RESTORATION IS ACCEPTABLE, ARCADIS WILL ASSUME MONITORING AND MAINTENANCE RESPONSIBILITY FOR THREE YEARS TO MEET THE SOLE PERFORMANCE CRITERIA OF 90% NATIVE COVER. IF IT IS CONCLUDED BASED ON THE SPRING 2012 JOINT INSPECTION THAT THESE DISTURBED AREAS HAVE NOT BEEN SATISFACTORILY RESTORED, THEN THE FOREST PRESERVE WILL TAKE OVER RESPONSIBILITY FOR THE MONITORING AND MAINTENANCE OF THESE SEEDED AREAS

RECORD DRAWINGS

TO THE BEST OF OUR KNOWLEDGE,
INFORMATION AND BELIEF, THESE RECORD
DRAWINGS SUBSTANTIALLY REPRESENT THE
PROJECT AS CONSTRUCTED.

DATE BY

B-7B

TABLE 1

Upland Trees and Shrubs			
Sym.	Scientific Name	WI	Common Name
CCO	<i>Carya cordiformis</i> (FACU)	Bitternut Hickory	
COV	<i>Carya ovata</i> (FACU)	Shagbark Hickory	
JN	<i>Juglans nigra</i> (FACU)	Black Walnut	
MI	<i>Malus ioensis</i> (UPL)	Iowa Crab	
OV	<i>Ostrya virginiana</i> (FACU-)	Ironwood	
OA	<i>Quercus alba</i> (FACU)	White Oak	
QM	<i>Quercus macrocarpa</i> (FAC)	Bur Oak	
QV	<i>Quercus velutina</i> (UPL)	Black Oak	
Understory Trees, Shrubs and Vines			
CES	<i>Celastrus scandens</i> (UPL)	Climbing Bittersweet	
CA	<i>Corylus americana</i> (FACU-)	American Hazelnut	
CCA	<i>Crataegus calpodendron</i> (FACU-)	Sugar Hawthorn	
CCC	<i>Crataegus coccinea</i> (UPL)	Scarlet Hawthorn	
CCG	<i>Crataegus crus-galli</i> (FACU-)	Cockspur Hawthorn	
LP	<i>Lonicera periclymenum</i> (UPL)	Yellow Honeysuckle	
PA	<i>Prunus americana</i> (UPL)	Wild Plum	
PV	<i>Prunus virginiana</i> (FACU)	Choke Cherry	
PT	<i>Ptelea trifoliata</i> (UPL)	Wafer Ash	
VL	<i>Viburnum lentago</i> (FAC+)	Nannyberry	
VP	<i>Viburnum prunifolium</i> (FACU)	Blackhaw	
XA	<i>Xanthoxylum americanum</i> (UPL)	Prickly Ash	

NOTE:

1. Values in parenthesis are wetland indicator status, refer to tables in Attachment B-1 for additional information.

TABLE 2

Floodplain Trees and Shrubs			
Sym.	Scientific Name	WI	Common Name
	Trees		
CO	<i>Celtis occidentalis</i> (FAC-)	Hackberry	
JN	<i>Juglans nigra</i> (FACU)	Black Walnut	
MR	<i>Morus rubra</i> (FAC-)	Red Mulberry	
QB	<i>Quercus bicolor</i> (FACW+)	Swamp White Oak	
QM	<i>Quercus macrocarpa</i> (FAC)	Bur Oak	
SN	<i>Salix nigra</i> (FACW+)	Black Willow	
	Shrubs		
COC	<i>Cephaelanthus occidentalis</i> (OBL)	Buttonbush	
COB	<i>Cornus obliqua</i> (FACW+)	Silky Dogwood	
CS	<i>Cornus stolonifera</i> (FACW)	Red Osier Dogwood	
RA	<i>Ribes americanum</i> (FACW)	Wild Black Currant	
SD	<i>Salix discolor</i> (FACW)	Pussy Willow	
SC	<i>Sambucus canadensis</i> (FACW)	Common Elderberry	
VL	<i>Viburnum lentago</i> (FAC+)	Nannyberry	

NOTE:

1. Values in parenthesis are wetland indicator status, refer to tables in Attachment B-1 for additional information.

TABLE 6

Lbs./Acre	Scientific Name	Common Name
0.063	<i>Actinomeris (Verbisina) alternifolia</i>	Wingstem
0.375	<i>Alisma subcordatum</i>	Common Water Plantain
0.063	<i>Alisma triviale</i>	Northern Water Plantain
0.031	<i>Anemone canadensis</i>	Meadow Anemone
0.25	<i>Asclepias incarnata</i>	Swamp Milkweed
0.375	<i>Aster nova-angliae</i>	New England Aster
0.031	<i>Aster simplex (lanceolatus)</i>	Panicled Aster
0.75	<i>Bidens cernua</i>	Nodding Bur Marigold
0.063	<i>Boehmeria cylindrica</i>	False Nettle
0.5	<i>Calamagrostis canadensis</i>	Blue Joint Grass
0.188	<i>Carex cristatella</i>	Crested Sedge
0.063	<i>Carex pellita (C. lanuginosa)</i>	Broad Leaved Wooly Sedge
0.25	<i>Carex scoparia</i>	Pointed Broom Sedge
0.5	<i>Carex stipata</i>	Awl-fruited Sedge
0.063	<i>Carex stricta</i>	Strict Sedge
0.25	<i>Carex tribuloides</i>	Awl-fruited Sedge
1	<i>Carex vulpinoida</i>	Fox Sedge
1	<i>Cyperus esculentus</i>	Field Nut Sedge
1	<i>Echinochloa crusgalli</i>	Barnyard Grass
0.063	<i>Eleocharis erythropoda</i>	Red-rooted Spike Rush
0.015	<i>Erigeron philadelphicus</i>	Marsh Fleabane
0.125	<i>Eupatorium maculatum</i>	Spotted Joe Pye Weed
0.125	<i>Eupatorium perfoliatum</i>	Thoroughwort
0.015	<i>Galium tinctorium</i>	Stiff Bedstraw
0.188	<i>Gentiana andrewsii</i>	Bottle Gentian
0.125	<i>Glyceria striata</i>	Fowl Manna Grass
0.125	<i>Helenium autumnale</i>	Sneezeweed
0.188	<i>Iris virginica shrevei</i>	Blue Flag
0.25	<i>Juncus torreyi</i>	Torrey's Rush
0.5	<i>Leersia oryzoides</i>	Rice Cut Grass
0.031	<i>Lobelia siphilitica</i>	Blue Lobelia
0.188	<i>Lycopus americanus</i>	Common Water Horehound
0.015	<i>Lycopus virginicus</i>	Bugle Weed
0.015	<i>Lysimachia thyrsiflora</i>	Tufted Loosestrife
0.015	<i>Lythrum alatum</i>	Winged Loosestrife
0.015	<i>Mentha arvensis villosa</i>	Wild Mint
0.015	<i>Mimulus ringens</i>	Monkey Flower
0.015	<i>Penthorus sedoides</i>	Ditch Stoncrop
0.125	<i>Pontederia cordata</i>	Pickerel Weed
0.125	<i>Pycnanthemum virginianum</i>	Common Mt Mint
0.015	<i>Rudbeckia laciniata</i>	Wild Goldenglow
0.25	<i>Sagittaria latifolia</i>	Duck Potato
0.25	<i>Scirpus acutus (Schoenoplectus a.)</i>	Hard Stem Bulrush
1	<i>Scirpus atrovirens</i>	Dark Green Rush
0.125	<i>Scirpus fluviatilis</i>	River Bulrush
0.25	<i>Scirpus validus (Schoenoplectus tabernaemontani)</i>	Great Bulrush
0.015	<i>Scutellaria lateriflora</i>	Mad Dog Skullcap
0.063	<i>Solidago gigantea</i>	Late Goldenrod
0.125	<i>Sparganium eurycarpum</i>	Common Bur-reed
0.063	<i>Teucrium canadense</i>	Germander
1	<i>Verbena hastata</i>	Blue Vervain
0.188	<i>Vernonia fasciculata</i>	Common Ironweed
Cover crop: Avena sativa (Seed Oats) @ 32 lbs. per acre		

NOTES:

1. Seed applied at rate of 12 lbs. per acre plus cover crop.

2. Zizania palustris (Wild Rice) to be additionally broadcast into areas with saturated soils at a rate of 50 lbs. per acre at locations suggested by the Local Communities.

TABLE 3

Upland Savanna Seed Mix	
Scientific Name	Common Name
<i>Allium canadense</i>	Wild Onion
<i>Anemone thalictroides</i>	Rue Anemone
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit
<i>Aster lateriflorus</i>	Side-flowering Aster
<i>Campanula americana</i>	Tall Bellflower
<i>Carex blanda</i>	Common Wood Sedge
<i>Carex grisea</i>	Wood Gray Sedge
<i>Carex hirtifolia</i>	Hairy Wood Sedge
<i>Carex normalis</i>	Spreading Oval Sedge
<i>Carex rosea</i>	Curly-styled Wood Sedge
<i>Carex sparganioides</i>	Loose-headed Bracted Sedge
<i>Carex sprengelii</i>	Long-beaked Sedge
<i>Carex tenera</i>	Narrow-leaved Oval Sedge
<i>Cinna arundinacea</i>	Common Wood Reed
<i>Dioclea villosa</i>	Wild Yam
<i>Dodecatheon meadia</i>	Shooting Star
<i>Elymus riparius</i>	Riverbank Wild Rye
<i>Elymus villosus</i>	Silky Wild Rye
<i>Elymus virginicus</i>	Virginia Wild Rye
<i>Eupatorium purpureum</i>	Purple Joe-Pye Weed
<i>Geranium maculatum</i>	Wild Geranium
<i>Glyceria striata</i>	Fowl Manna Grass
<i>Helianthus strumosus</i>	Pale-leaved Sunflower
<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
<i>Hystrrix patula</i>	Bottlebrush Grass
<i>Lilium michiganense</i>	Michigan Lily
<i>Osmorrhiza claytonii</i>	Hairy Sweet Cicely
<i>Phryma leptostachya</i>	Lopseed
<i>Polygonatum reptans</i>	Jacob's Ladder
<i>Polygonatum canaliculatum</i>	Solomon's Seal
<i>Polygonum virginianum</i>	Woodland Knotweed
<i>Ranunculus septentrionalis</i>	Swamp Buttercup
<i>Rudbeckia triloba</i>	Brown-eyed Susan
<i>Smilacina racemosa</i>	Feathery False Solomon's Seal
<i>Solidago ulmifolia</i>	Elm-leaved Goldenrod
<i>Sphenopholis intermedia</i>	Slender Wedge Grass
<i>Vernonia altissima</i>	Smooth Tall Ironweed

NOTE:

1. Seed applied at rate of 10 lbs. per acre plus cover crop, if required.

TABLE 4

Lbs./Acre	Scientific Name	Common Name
1.5	<i>Andropogon gerardii</i>	Big Bluestem
0.063	<i>Asclepias incarnata</i>	Swamp Milkweed
0.125	<i>Aster laevis</i>	Smooth Blue Aster
0.031	<i>Aster novae-angliae</i>	New England Aster
0.031	<i>Aster preitius</i>	Willow Aster
0.25	<i>Baptisia leucantha</i>	Wild White Indigo
0.063	<i>Bidens sp.</i>	Ticksed
0.25	<i>Calamagrostis canadensis</i>	Blue Joint Grass
0.125	<i>Carex annectens xanthocarpa</i>	Small Yellow Fox Sedge
0.125	<i>Carex bebbii</i>	Bebb's Sedge
0.063	<i>Carex buxbaumii</i>	Sedge
0.125	<i>Carex normalis</i>	Normal Sedge
0.125	<i>Carex vulpinoidea</i>	Fox Sedge
0.031	<i>Chelone glabra</i>	Turtle head
0.15	<i>Desmodium canadense</i>	Showy Tick Trefoil
0.062	<i>Eleocharis acicularis</i>	Needle Spike Rush
0.062	<i>Eleocharis erythropoda</i>	Red-Rooted Spike Rush
1.5	<i>Elymus virginicus</i>	Virginia Wild Rye
0.259	<i>Eupatorium maculatum</i>	Spotted Joe Pye Weed
0.115	<i>Eupatorium perfoliatum</i>	Boneset
0.5	<i>Helenium autumnale</i>	Sneezeweed
0.5	<i>Glyceria striata</i>	Fowl Manna Grass
0.125	<i>Iris virginica shrevei</i>	Blue Flag



Appendix J

Representative Project Photographs

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 1	
PHOTOGRAPHER: M. Savage	
DATE: 09/02/2008	
DIRECTION: North	
COMMENT: <p>Preconstruction photo, looking upstream at the Warrenville Grove Dam and southern end of Reach 7 on the east bank.</p>	

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 2	
PHOTOGRAPHER: M. Savage	
DATE: 01/28/2009	
DIRECTION: Southeast	
COMMENT: <p>Preconstruction photo, looking southeast at the northern end of Reach 7, standing on the Prairie Path pedestrian bridge.</p>	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: Tronox LLC	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 3	
PHOTOGRAPHER: M.Savage	
DATE: 04/15/2010	
DIRECTION: North	
COMMENT: <p>Preconstruction photo, looking north at Excavation Area R7-1 on east bank.</p>	 <p>04/15/2010</p>

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 3	
PHOTOGRAPHER: M. Savage	
DATE: 06/19/2010	
DIRECTION: Southeast	
COMMENT: <p>Clearing of main staging area in Reach 7. [Note: On right side of photo certain trees were cut off high so the remaining trunk and root ball could be saved for root wad installations.</p>	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 5	
PHOTOGRAPHER: M. Savage	
DATE: 06/25/2010	
DIRECTION: North	
COMMENT: <p>Facing north with the Prairie Path pedestrian bridge in the background, showing cleared bypass piping corridor on the west side of the river.</p>	

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 6	
PHOTOGRAPHER: M. Savage	
DATE: 06/25/2010	
DIRECTION: South	
COMMENT: <p>Standing on Prairie Path pedestrian bridge, looking south at cleared area in Excavation Area R7-1.</p>	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 7	
PHOTOGRAPHER: M. Savage	
DATE: 06/28/2010	
DIRECTION: East	
COMMENT: <p>Mussel relocation being performed in Reach 7 by representatives of Forest Preserve District of DuPage County, WBK Associates and ARCADIS.</p>	

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 8	
PHOTOGRAPHER: M. Savage	
DATE: 07/13/2010	
DIRECTION: North	
COMMENT: <p>Sheetpiling being driven in river for wet well for Reach 7 bypass pumping system, just south of Butterfield Road Bridge. Sheetpiling is being driven by MoVax positioned on floating barge in the river.</p>	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 9 PHOTOGRAPHER: J. Kotwicki DATE: 7/14/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
	
COMMENT: Crane picking HDPE pipe for pump manifold.	
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 10 PHOTOGRAPHER: J. Kotwicki DATE: 7/15/2010 DIRECTION: Southeast	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
	
COMMENT: Installation of the energy dissipation structure located south of the Warrenville Grove Dam.	

**Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL**

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 11 PHOTOGRAPHER: J. Kotwicki DATE: 7/15/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Welding 48 inch HDPE pipe in the pipe corridor.	
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 12 PHOTOGRAPHER: J. Kotwicki DATE: 7/16/2010 DIRECTION: West	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Armoring the bank in the Warrenville Grove Forest Preserve in R8-2.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 13 PHOTOGRAPHER: J. Kotwicki DATE: 7/17/2010 DIRECTION: West	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Bypass pump staging area and wet well located west of the Butterfield Road Bridge.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 14 PHOTOGRAPHER: J. Kotwicki DATE: 7/17/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Silt curtain installed north of the Butterfield Road Bridge.	

**Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL**

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 15 PHOTOGRAPHER: J. Kotwicki DATE: 7/19/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Targeted material Staging area.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 16 PHOTOGRAPHER: J. Kotwicki DATE: 7/20/2010 DIRECTION: West	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Overburden laydown area.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 17 PHOTOGRAPHER: J. Kotwicki DATE: 7/20/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Installation of the Phase 2 Upstream Sheetpile Diversion Dam.	
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 18 PHOTOGRAPHER: J. Kotwicki DATE: 7/22/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Installation of Bypass pipe manifold.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 19 PHOTOGRAPHER: J. Kotwicki DATE: 7/22/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Continued set up of Targeted Material stabilization area.	
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 20 PHOTOGRAPHER: J. Kotwicki DATE: 7/22/2010 DIRECTION: Southwest	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Securing flanges in bypass piping prior to starting the pumps.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 21 PHOTOGRAPHER: J. Kotwicki DATE: 7/22/2010 DIRECTION: Northwest	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Bypass pump staging area upon completion of set up. Note: photo taken from Prairie Path bridge.	
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 22 PHOTOGRAPHER: J. Kotwicki DATE: 7/22/2010 DIRECTION: Southeast	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Crew began starting and testing bypass pumps.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 23 PHOTOGRAPHER: J. Kotwicki DATE: 7/22/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Bypass piping outfall and energy dissipation structure in operation.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 24 PHOTOGRAPHER: J. Kotwicki DATE: 7/23/2010 DIRECTION: West	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Operational wet well.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 25 PHOTOGRAPHER: J. Kotwicki DATE: 7/23/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Phase 2 Upstream Sheetpile Diversion Dam during dewatering activities.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 26 PHOTOGRAPHER: J. Kotwicki DATE: 7/23/2010 DIRECTION: Northwest	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Fish shocking and relocation activities.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 27 PHOTOGRAPHER: J. Kotwicki DATE: 7/23/2010 DIRECTION: Northwest	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Fish shocking and relocation activities.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 28 PHOTOGRAPHER: J. Kotwicki DATE: 7/24/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Warrenville Grove Dam. Note: Photo taken after the major flood.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 29 PHOTOGRAPHER: J. Kotwicki DATE: 7/24/2010 DIRECTION: Southeast	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Pipe corridor with main channel beyond. Note: Photo taken after the major flood.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 30 PHOTOGRAPHER: J. Kotwicki DATE: 7/24/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Haul road from the staging area to the R7-1 excavation area.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 31 PHOTOGRAPHER: J. Kotwicki DATE: 7/28/2010 DIRECTION: West	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
	
COMMENT: Installation of the paved entrance to the bypass pump staging area located south of Butterfield Road and east off of Batavia Road.	
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 32 PHOTOGRAPHER: J. Kotwicki DATE: 8/3/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
	
COMMENT: Installation of poly sheeting in the Targeted Material stabilization area.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 33 PHOTOGRAPHER: J. Kotwicki DATE: 8/4/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Warrenville Grove Dam after an additional flood.	
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 34 PHOTOGRAPHER: J. Kotwicki DATE: 8/6/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Railcars positioned on the railroad at the Railcar Loading Facility.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 35 PHOTOGRAPHER: J. Kotwicki DATE: 8/9/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Crew reassembling and priming dewatering pumps after site flooding.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 36 PHOTOGRAPHER: J. Kotwicki DATE: 8/11/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Post flood main channel area after bypass pumping was restarted.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 37 PHOTOGRAPHER: J. Kotwicki DATE: 8/12/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Northern portion of Reach 7 during bypass pumping.	
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 38 PHOTOGRAPHER: J. Kotwicki DATE: 8/12/2010 DIRECTION: West	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Survey verification of overburden in the central portion of Reach 7.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 39 PHOTOGRAPHER: J. Kotwicki DATE: 8/13/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Installation of the articulated concrete block immediately downstream of the Phase 2 Upstream Sheetpile Diversion Dam. Note: Sheetpile located on left is the Phase 2 Upstream Diversion Dam and sheetpile on the right is the remaining northern wall of the R7-1 excavation.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 40 PHOTOGRAPHER: J. Kotwicki DATE: 8/13/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Excavation and verification of overburden in excavation R7-1.	

**Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL**

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 41 PHOTOGRAPHER: J. Kotwicki DATE: 8/13/2010 DIRECTION: West	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Sump located along the eastern bank of the central portion of Reach 7.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 42 PHOTOGRAPHER: J. Kotwicki DATE: 8/14/2010 DIRECTION: Southeast	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Phase 2 Upstream Sheetpile Diversion Dam after another heavy rainfall and flooding.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 43 PHOTOGRAPHER: J. Kotwicki DATE: 8/16/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Excavation and dewatering of Targeted Material located in the R7-1 excavation.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 44 PHOTOGRAPHER: J. Kotwicki DATE: 8/16/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Off-road truck unloading Targeted Material onto the Targeted Material stabilization pad.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 45 PHOTOGRAPHER: J. Kotwicki DATE: 8/17/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Excavation of overburden in R7-3.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 46 PHOTOGRAPHER: J. Kotwicki DATE: 8/17/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Equipment managing Targeted Material in the stabilization pad.	

**Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL**

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 47 PHOTOGRAPHER: J. Kotwicki DATE: 8/17/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Additional overburden staging area which was cleared and grubbed.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 48 PHOTOGRAPHER: J. Kotwicki DATE: 8/18/2010 DIRECTION: West	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Survey verification of Targeted Material in R7-3.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 49 PHOTOGRAPHER: J. Kotwicki DATE: 8/19/2010 DIRECTION: Northwest	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Warrenville Grove Dam after removing the limestone face as part of notching activities.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 50 PHOTOGRAPHER: J. Kotwicki DATE: 8/20/2010 DIRECTION: Northwest	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Notching of the Warrenville Grove Dam.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 51 PHOTOGRAPHER: J. Kotwicki DATE: 8/20/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Dozer installing 6 inch lift of overburden in the overburden laydown area for verification.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 52 PHOTOGRAPHER: J. Kotwicki DATE: 8/20/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: IEMA completing overburden gamma surveying activities for verification.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 53 PHOTOGRAPHER: J. Kotwicki DATE: 8/21/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Phase 2 Upstream Sheetpile Diversion Dam overtopping with water after another heavy rainfall event.	
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 54 PHOTOGRAPHER: J. Kotwicki DATE: 8/23/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Excavation of Targeted Material in R7-3.	

**Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL**

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 55 PHOTOGRAPHER: J. Kotwicki DATE: 8/24/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Crew lining truck bed with poly sheeting to prevent leakage.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 56 PHOTOGRAPHER: J. Kotwicki DATE: 8/24/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Excavation and load out of the main channel area of R7-3.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 57 PHOTOGRAPHER: J. Kotwicki DATE: 8/26/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Excavation along the west bank of the main channel area; adjacent to Riverview Road.	
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 58 PHOTOGRAPHER: J. Kotwicki DATE: 8/26/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Stockpiling unscreened river rock in the staging area.	

**Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL**

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 59 PHOTOGRAPHER: J. Kotwicki DATE: 8/27/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Excavators stabilizing Targeted Material with lime on the stabilization pad.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 60 PHOTOGRAPHER: J. Kotwicki DATE: 8/30/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Loading Targeted Material from the stabilization pad onto truck for transport to the Rare Earths Facility.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 61 PHOTOGRAPHER: J. Kotwicki DATE: 8/30/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
	 <p>COMMENT: Unloading Targeted Material at the Railcar Loading Facility.</p>

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 62 PHOTOGRAPHER: J. Kotwicki DATE: 9/2/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
	 <p>COMMENT: Excavation of Targeted Material located in the main channel area between the north and south islands of Reach 7.</p>

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 63 PHOTOGRAPHER: J. Kotwicki DATE: 9/3/2010 DIRECTION: Northeast	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Phase 2 Upstream Sheetpile Diversion Dam after another heavy rain event.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 64 PHOTOGRAPHER: J. Kotwicki DATE: 9/7/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Excavation and load out of Targeted Material from the main channel area of R7-3.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 65 PHOTOGRAPHER: J. Kotwicki DATE: 9/7/2010 DIRECTION: Northeast	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Shuttlewagon positioning railcars for Targeted Material loading at the Railcar Loading Facility.	
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 66 PHOTOGRAPHER: J. Kotwicki DATE: 9/8/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: View from the Prairie Path Bridge of the northern portion of Reach 7 during bypass pumping and excavation activities.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 67 PHOTOGRAPHER: J. Kotwicki DATE: 9/9/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Excavation activities in the northern portion of Reach 7.	
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 68 PHOTOGRAPHER: J. Kotwicki DATE: 9/9/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Excavation activities in the central portion of Reach 7.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 69 PHOTOGRAPHER: J. Kotwicki DATE: 9/11/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Construction of an additional Targeted Material Stabilization Pad.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 70 PHOTOGRAPHER: J. Kotwicki DATE: 9/11/2010 DIRECTION: West	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Construction of an additional overburden laydown area.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 71 PHOTOGRAPHER: J. Kotwicki DATE: 9/13/2010 DIRECTION: Northeast	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Northern and southern excavations met in the main channel area (west of north island) when the northern main channel and central excavations were completed.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 72 PHOTOGRAPHER: J. Kotwicki DATE: 9/14/2010 DIRECTION: Southeast	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Phase 2A (southern backwater area) prior to excavation.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 73 PHOTOGRAPHER: J. Kotwicki DATE: 9/16/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Northern portion of Reach 7 with exposed face of R7-3 backwater area.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 74 PHOTOGRAPHER: J. Kotwicki DATE: 9/16/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Face of R7-3 and approximate location of the northern Phase 3 Sheetpile Dam.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 75 PHOTOGRAPHER: J. Kotwicki DATE: 9/17/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Installation of rock blanket material in the northern portion of the main channel.	
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 76 PHOTOGRAPHER: J. Kotwicki DATE: 9/17/2010 DIRECTION: Northeast	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Installation of rock blanket material in the northern portion of the main channel.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 77 PHOTOGRAPHER: J. Kotwicki DATE: 9/18/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Survey activities in the central portion of Reach 7.	 A photograph showing surveying activity on a riverbank. In the foreground, a surveyor in a yellow vest and hard hat stands next to a yellow tripod-mounted survey instrument. Another surveyor is visible in the background near a yellow excavator. The site is a sandy, cleared area with dense trees in the background.
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 78 PHOTOGRAPHER: J. Kotwicki DATE: 9/18/2010 DIRECTION: Southeast	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Installation of rock blanket material in the northern portion of the main channel.	 A photograph showing construction activity in a river channel. A yellow dump truck is partially submerged in the water, with its bed filled with dirt or rock. An excavator is positioned behind it, dumping material into the truck's bed. Several workers in safety vests and hard hats are standing around the site, which is surrounded by dense green trees.

**Kress Creek/West Branch DuPage River Remedial Action Project
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CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 79 PHOTOGRAPHER: J. Kotwicki DATE: 9/20/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Excavation of the southern main channel area of Reach 7.	
CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 80 PHOTOGRAPHER: J. Kotwicki DATE: 9/21/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Rock berm dividing the northern main channel and the northern backwater area.	

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Reach 7
DuPage County, IL**

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 81 PHOTOGRAPHER: J. Kotwicki DATE: 9/21/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Installation of the rock blanket in the northern main channel area of Reach 7.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 82 PHOTOGRAPHER: J. Kotwicki DATE: 9/22/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Installation of the rock blanket in the northern main channel area of Reach 7.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 83 PHOTOGRAPHER: J. Kotwicki DATE: 9/23/2010 DIRECTION: Southeast	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Excavation of the Phase 2A (southern backwater area).	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 84 PHOTOGRAPHER: J. Kotwicki DATE: 9/23/2010 DIRECTION: South	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Excavation of the southern main channel area of Reach 7.	

**Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL**

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 85 PHOTOGRAPHER: J. Kotwicki DATE: 9/23/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Installation of rock blanket material and placement of boulders in the northern main channel area of Reach 7.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 86 PHOTOGRAPHER: J. Kotwicki DATE: 9/24/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Decontamination of an off road truck at the Targeted Material Stabilization Pad.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 87 PHOTOGRAPHER: J. Kotwicki DATE: 9/25/2010 DIRECTION: North	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: View of the Phase 2A (southern backwater area) and main channel excavations working toward the Warrenville Grove Dam; facing upstream.	

CLIENT: WCERT PROJECT #: B0071034.0000 PHOTOGRAPH #: 88 PHOTOGRAPHER: J. Kotwicki DATE: 9/30/2010 DIRECTION: East	SITE NAME: Kress Creek/West Branch DuPage River SITE LOCATION: DuPage County, IL
COMMENT: Application of ConCover to the Targeted Material pile in the staging area.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 89	
PHOTOGRAPHER: Aerial by FP	
DATE: 10/19/2010	
DIRECTION: NA	
COMMENT: Aerial photo shows two targeted material stockpiles located in the Reach 7 main staging area. The targeted material was mixed with lime for stabilization prior to trucking to the Railcar Loading facility (RLF).	

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 90	
PHOTOGRAPHER: M. Savage	
DATE: 11/19/2010	
DIRECTION: West	
COMMENT: Cluster of root wads installed by contractor for Forest Preserve District of Dupage County. Cluster is located in northern backwater area of Reach 7.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 91	
PHOTOGRAPHER: M. Savage	
DATE: 02/01/2011	
DIRECTION: Southwest	
COMMENT: Stockpile of targeted material stored at REF and covered with tarps and staked sand bags. Awaiting railcars for loading.	

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 92	
PHOTOGRAPHER: M. Savage	
DATE: 04/11/2011	
DIRECTION: South	
COMMENT: Standing on Prairie Path pedestrian bridge facing south, looking at northeast section of Reach 7 that was hydroseeded and erosion control blankets installed.	

Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 93	
PHOTOGRAPHER: M. Savage	
DATE: 04/11/2011	
DIRECTION: South	
COMMENT: Looking south at bypass pipe corridor on west side of river, after it was hydroseeded and erosion control blankets installed in drainage swales.	

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 94	
PHOTOGRAPHER: M. Savage	
DATE: 05/17/2011	
DIRECTION: South	
COMMENT: All targeted material from Reach 7 had been loaded in railcars and shipped by this date, and the RLF staging area was graded and the small N-S berm installed for drainage.	

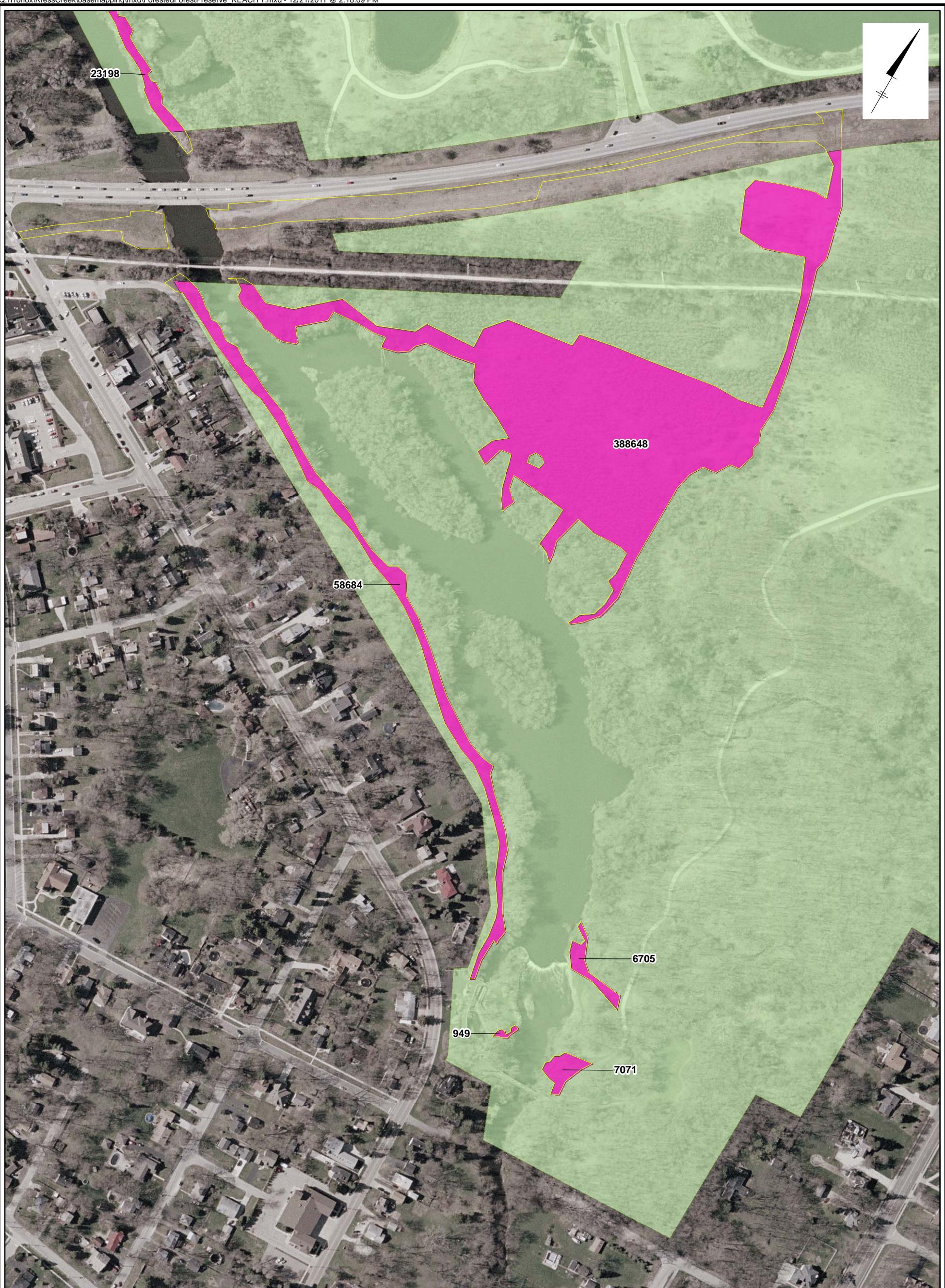
Kress Creek/West Branch DuPage River Remedial Action Project
Reach 7
DuPage County, IL

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 95	
PHOTOGRAPHER: M. Savage	
DATE: 05/17/2011	
DIRECTION: West	
COMMENT: <p>Final grading of the Reach 7 main staging area under the direction of WBK and the Forest Preserve. A new wetland area was constructed, to capture and utilize the discharge from old farm tile piping in the area.</p>	

CLIENT: WCERT	SITE NAME: Kress Creek/West Branch DuPage River
PROJECT #: B0071034.0000	SITE LOCATION: DuPage County, IL
PHOTOGRAPH #: 96	
PHOTOGRAPHER: M. Savage	
DATE: 05/17/2011	
DIRECTION: West	
COMMENT: <p>Hydroseeding Reach 7 main staging area after final grading was completed.</p>	

Appendix K

Forest Preserve Disturbed Acreage –
Reach 7



LEGEND:

- [Yellow Box] LIMITS OF DISTURBANCE
- [Pink Box] FORESTED FOREST PRESERVE LAND
- [Light Green Box] FOREST PRESERVE LAND

NOTES:

1. AREAS SHOWN IN SQUARE FEET
2. AERIAL PHOTOS DOWNLOADED FROM THE ILLINOIS NATURAL RESOURCES GEOSPATIAL DATA CLEARINGHOUSE AT <http://www.isgs.uiuc.edu/nsdihome/>

0 250 500 Feet
GRAPHIC SCALE

TRONOX LLC
KRESS CREEK/WEST BRANCH DUPAGE RIVER SITE

REACH 7

 ARCADIS

FIGURE
1